

JANUARY

FOCUS: OUTLOOK '89

Further gains expected 48

Record production and earnings of last year should be exceeded in 1989 due to high current operating rates and the weak U.S. dollar; capital spending will reach an all-time high of \$11.5 billion

Uncoated free-sheet	51
Coated paper	53
Tissue	54
Containerboard/kraft paper	54
Boxboard	55
Wastepaper	56

Canadian forecast 63

Increased competition in the global marketplace has Canadian companies focusing on cutting costs, upgrading facilities, and improving quality and service; gradual slowdown seen for '89

Newsprint	65
Uncoated groundwood paper	66
Market pulp	68

Labor 69

This will be a busy year for labor in the U.S., with 120 mills negotiating new contracts; major issues include mandatory health insurance, child-care provisions, and retiree benefits

Regulations 70

Increased government regulation will be seen in three areas this year: mandatory source separation, Clean Air Act amendments, and dioxin

Market pulp 71

Although pulp prices have nearly doubled over the last three years, market may be approaching peak; analysts anticipate a down cycle

CAPITAL SPENDING

P&P's annual survey 107

Record capital spending plans in the U.S. and Canada are the result of strong demand and top prices for most grades; plans stretch well into '90s



OTHER FEATURES

PAPERMAKING

Tissue conference 96

Tissue makers heard the latest on equipment, techniques, and machine developments in the 1990s at recent international meeting in Florida

Super wet presses 129

Over 100 containerboard machines will use new super wet presses by the end of this decade; hot press for small machines has been developed in Spain

EXPANSION/MODERNIZATION

New production record 82

Pulp machine rebuild has enabled Leaf River to more than double its original design production capacity, going from 950 to 1,900 metric tpd

ENGINEERING/MAINTENANCE

Whitewater systems 83

Whitewater reuse has increased dramatically but with difficulty; proper design by mill engineers will prevent system operating problems

Synthetic lubricants 127

Nekoosa Packaging mill has reduced downtime and increased bearing life by using synthetic lubricants as part of its preventive maintenance program

FINISHING/CONVERTING

Brush calenders 94

Swiss mill improves surface quality of paperboard by installing special brush calender units; better ink setting and higher gloss have been achieved

THE COVER

Pulp & Paper's exclusive Outlook '89 (p. 48) and Capital Spending (p. 107) reports indicate 1989 will be another banner year for the North American paper industry. (Photo of construction work on building that will house new newsprint machine being installed at Finlay Forest Industries mill in British Columbia courtesy of Fletcher Challenge Canada.)

EDITORIAL STAFF

ATLANTA

Editor in Chief Ken L. Patrick
Executive Editor Kenneth E. Smith
Projects Editor Kelly H. Ferguson

SAN FRANCISCO

Technical Editor Michael J. Ducey
Departments Editor Beverlee Davis
Staff Editor John Mikulenska

CHICAGO

Technical Editor Andy Harrison

NEW YORK

Consulting Editor John C.W. Evans

BRUSSELS

International Editors Peter Sutton
John Pearson
Hugh O'Brian

NEWS STAFF

SAN FRANCISCO

Executive News Editor Willard E. Mjes
Senior News Editor Debra A. Garcia
News Editor Carl P. Espe
News Editor Rob Galin
News Editor Regina McGrath

NEW YORK

News Editor Noel Deking

PRODUCTION STAFF

SAN FRANCISCO

Managing Editor Paula J. Jones
Assistant Managing Editor Margaret L. Brown
Art Editor Nancy E. Bentley
Copy/Production Editor Maria L. Dils
Editorial Assistant Virginia C. Stefan
Technical Artist Pamela S. Patrusky

Atlanta: 2700 Cumberland Parkway, N.W., Suite 300
Atlanta, Ga. 30339; (404) 432-3189; Fax (404) 432-3834
Chicago: 35 E. Wacker Drive, Chicago, Ill. 60601
(312) 372-6238; Fax (312) 372-3864
San Francisco: 500 Howard Street, San Francisco, Calif.
94105; (415) 397-1881; Telex 278273; Fax (415) 543-0256
New York: 370 Lexington Avenue, New York, N.Y. 10017
(212) 683-9294; Telex 220442; Fax (212) 745-0915
Brussels: Chaussée de Charleroi 123a, Boite 5, B-1060
Brussels, Belgium; Telex 846-24672

PUBLISHING HEADQUARTERS

SAN FRANCISCO

Publishing Director Leigh M. Freeman
Group Publisher Leonard E. Haas
Director of Production Andrew A. Mickus
Director of Circulation Wini D. Ragus
Ad Production Coordinator Gary A. Fong
Clerical Assistant Carol L. Parkinson

Sales and business offices
are listed on Advertisers' Index page



Chairman of the Board Lord David R. Stevens
President Marshall W. Freeman
Vice President Charles C. Baake
Vice President Leigh M. Freeman
Vice President Leonard E. Haas
Vice President Barbara M. Hampson
Vice President Thomas L. Kemp
Vice President Wini D. Ragus
Corporate Financial Manager Charles H. Benz
Secretary/Treasurer Miller Freeman III
Assistant Treasurer Douglas M. Denny

COLUMNS

From the Editors	7
by Ken L. Patrick Continuing emphasis on quality control	
Chemical Report	39
by Michael Ducey Dyestuff industry healthy; higher prices predicted	
Quality Report	135
by Lars Ingman "Controlling quality" vs "quality control"	
Career Development	139
by Roberto Bhasin How am I doing?	
Comment	200
by Julian McKien Labor year in review	

DEPARTMENTS

Conference Calendar	41
News of People	143
Product Showcase	155
New Products	155
Product Review	169
Literature	171
Bookshelf	175
Supplier News	177

SERVICES

Reader Service Index	149
Reader Service Review	150
Reader Service Card	151
Professional Service Directory	180
Classified Advertising	182
Advertisers Index	198

NEWS

Month in Statistics	9
U.S. paper and paperboard production data for October	
Market Report	11
Uncoated free-sheet grades hiked Jan. 1 linerboard increase faltering Manville to raise coated kraft board SBS price increase announced for Jan.	
Grade Profile	13
TISSUE: Producers try to make hikes stick in wake of escalating pulp prices	

NEWS SCAN

NBSK price hiked to over \$800	21
Quesnel starts up second pulp line	21
Fletcher Challenge plans upgrade	23
Nortek to export pulp to Korea	23
Fibreco opens mill	23
Scott to spend \$475 million	25
Fraser studying LWC machine	25
Glatfelter expands at Spring Grove	25
Consolidated plans rebuilds	25
Lake Superior studies machine	25
St. Marys' new machine starts up	25



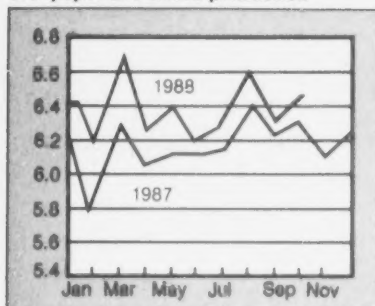
Newsprint expansions planned	27
Inland Container to expand mill	27
Gaylord sells mill to Fairfield	27
Con-Bath starts up new machine	29

International News	37
Hannover to integrate mill	
KNP buys stake in competitor	
CHH to buy Caxton Paper	
Corrugated consolidation continues	

PULP & PAPER (ISSN 0033-4081), with which is combined *Paper Mill News*, *Paper Trade Journal* and *Pacific Pulp & Paper*, is published monthly except November when semimonthly by MILLER FREEMAN PUBLICATIONS, 500 Howard St., San Francisco, Calif. 94105. Second class postage paid at San Francisco and at additional mailing office. POSTMASTER: Please send address changes to PULP & PAPER, 500 Howard St., San Francisco, Calif. 94105. © Copyright 1988 by Miller Freeman Publications Inc. All rights reserved. **Subscriptions & Address Change:** Sent without charge in the U.S.A. & Canada (upon written request) to individuals in pulp, paper, and board manufacturing firms and paper converting firms. To all others there is a subscription charge of \$70.00 a year in the U.S. All subscriptions to other countries: US\$90.00 a year, except Europe and Mediterranean, US\$100.00 (air service included). Single copy, US\$7.00, except Buyers Guide, US\$35.00. 16mm microfilm, 35mm microfilm, 105mm microfiche, and article and issue photocopies are available from University Microfilms International, 300 N. Zeeb Rd., Ann Arbor, Mich. 48106; (313) 761-4700. Requests, subscription orders, and address changes must show name and position or job of individual, the name and location of mill, plant or office where employed, and the exact business or product produced at this location. **Send subscription correspondence to:** Circulation Department, PULP & PAPER, 500 Howard St., San Francisco, Calif. 94105. For address change, include label from recent issue.

MONTH IN STATISTICS

U.S. paper and board production



U.S. production of paper and paperboard totaled 6.5 million tons in October, up 1.2% from the same month in 1987, according to American Paper Institute figures. Despite flat growth for most of 1988, production is expected to set new records for virtually all the major grades. After seasonal adjustments, paper production through October was at a rate of 38.4 million tpy, up 4.2% from 1987, while the paperboard rate was 38.1 million tpy, up 2.3%. Total production should reach a record 76.8 to 77.0 million tons by year end, API reported.

Among major grades, printing and writing papers were up 5.8% through October, led by strong gains in groundwood and coated papers. Production of containerboard for domestic use was up 2.7% through the first ten months, keeping pace with a rise in corrugated box shipments of 3.1% over the same period. U.S. exports of unbleached kraft linerboard rose sharply in September but were still below the 1987 pace for the first three quarters.

Canadian newsprint shipments totaled 803,000 metric tons in October, down 1.0% from 1987, but operating rates at newsprint mills rose to 100%. Woodpulp shipments were off by 1.4%, with mills operating at 92% of capacity for the month. ■

	Latest month (000 short tons)	% change from year ago	Annualized year-to-date (000 short tons)	% change from year ago
--	----------------------------------	------------------------------	--	------------------------------

PAPER & PAPERBOARD PRODUCTION¹

Newsprint	Oct.	507	-0.2	5,971	2.4
Uncoated groundwood (s)	Oct.	148	19.4	1,617	6.7
Coated paper (s)	Oct.	617	2.3	7,410	8.6
Uncoated free sheet (s)	Oct.	953	-1.4	11,379	4.1
Other printing/writing	Oct.	124	3.3	1,513	9.6
Total packaging and other paper (s)	Oct.	435	0.0	5,207	2.8
Tissue	Oct.	470	3.3	5,488	3.7
Total paper	Oct.	3,254	1.3	38,585	4.5
Unbleached kraft paperboard	Oct.	1,582	1.0	19,356	2.6
Semichemical medium	Oct.	472	-0.4	5,707	1.4
Bleached paperboard	Oct.	381	4.4	4,491	1.6
Recycled paperboard	Oct.	776	0.5	8,873	4.3
Total paperboard	Oct.	3,210	1.0	38,427	2.6

Total U.S. paper and paperboard output	Oct.	6,465	1.2	77,012	3.6
---	-------------	--------------	------------	---------------	------------

PULP, WASTEPAPER & FIBER²

Total U.S. woodpulp production	Sept.	5,006	1.6	61,154	3.0
Market pulp production	Sept.	727	6.9	8,482	5.1
Wastepaper consumption at paper/board mills	Sept.	1,537	-0.5	18,836	3.5
Pulpwood consumption (cords)	Sept.	7,956	1.3	95,332	1.6

CONVERTED PRODUCTS STATISTICS³

Corrugated box shipments (billion ft ²)	Oct.	27.797	0.2	259,035 ⁴	3.1
Containerboard inventories at U.S. box plants and mills	Oct. 1	2,667	10.2		

INTERNATIONAL TRADE²

U.S. paper imports (including products)	Sept.	1,108	1.5	12,889	3.9
Imports of Canadian newsprint	Sept.	701	-5.1	8,531 ⁴	-1.3
U.S. paper exports (including products)	Sept.	509	17.3	5,614	7.3
Exports of unbleached kraft linerboard	Sept.	213	32.3	2,192	-2.8
Exports of woodpulp	Sept.	518	17.2	5,487	12.3
Norscan pulp inventories ⁴	Oct. 31	802	-8.3		
Norscan pulp operating rates ⁴	Sept.	91%	94%	100%	94%

CANADIAN STATISTICS⁵ (reported in metric tons)

Total newsprint shipments	Oct.	803	-1.0	8,148 ⁶	1.0
Operating rates	Oct.	100%	97%	99%	97%
Inventories held by U.S. consumers	Oct. 31	1,532	6.2		
Other paper/board shipments	Oct.	559	-2.1	5,567	4.7
Woodpulp shipments (export only)	Oct.	646	-1.4	6,704	0.9
Operating rates	Oct.	92%	95%	96%	96%

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn., Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = Shipments.

TISSUE: Producers try to make hikes stick in wake of escalating pulp prices

Grade structure: Tissue falls into two major groups: sanitary and "other." About 98% of total output is sanitary, including bathroom, facial, toweling, napkins, basestock for sanitary stock, wadding, and wipes. The "other" group includes basestock for waxing, wrapping, and miscellaneous.

The two major markets for tissue are consumer and commercial and industrial (C&I). Consumer tissue is purchased by people at grocery stores, while industrial tissue is bought by hotels, offices, restaurants, hospitals, prisons, and factories. About 38% of U.S. tissue production is C&I, while the larger portion is sold on the consumer market. Typical basis weights for tissue include 12 to 14 lb/3,000 ft² for single-ply bathroom tissue and 32 to 39 lb/3,000 ft² for single-ply towel.

Production/capacity: In the beginning of 1989, the tissue market will be trying to absorb new capacity that came onstream in late 1988 at James River Corp.'s Clatskanie, Ore., mill. The new machine has capacity for approximately 70,000 tpy. James River has still not revealed where or when it will install the two other tissue machines that it said it will bring onstream between 1989 and 1994.

Several new machines are slated for startup in the second half of this year, but the additional capacity should not have much of a downward effect on prices until the fourth quarter. The two largest machines will make recycled tissue. FSC Paper Co., Alsip, Ill., plans to start up an 80,000-tpy machine in October. Most of this machine's output will be sold to converters. Fort Howard Corp. will start up its third recycled tissue machine at its Rincon, Ga., mill in late 1989. It is also starting up a dry-form tissue machine at its Green Bay, Wis., mill in the middle of this year.

Outlook: Through the first nine months of 1988, U.S. tissue paper production was running at an annual rate of 5.471 million short tons—a 3.8% increase over the record 1987 level. Unlike most paper grades, demand for tissue paper does not fall off drastically during a recession since consumers view tissue products as a necessity. However, consumers may trade down

to lower-quality products or private-label brands. In a recession, C&I producers will fare worse since consumption of this grade is more closely tied to industrial production.

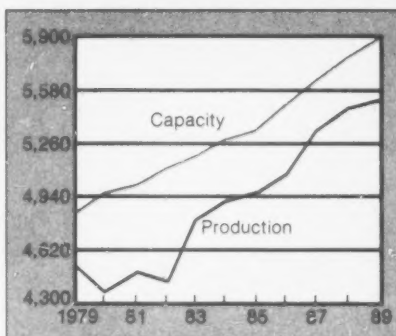
Tissue capacity is expected to remain tight during most of 1989. Barring a recession, producers of commercial tissue will probably try for another price increase in late spring or summer. C&I producers implemented two price increases in 1988—a 5% increase in the spring and a 6.9% increase in the fall. They implemented two increases at the same times in 1987. Producers generally get half of the announced price hikes, so they essentially have raised prices about 6% in each of the last two years.

Last year, producers of consumer tissue got behind their first increase on roll tissue products in about seven years. In April 1988, James River led the price increase attempt by announcing a 9.2% hike on toilet paper, a 5.6% increase on towels, a 5.0% increase on napkins, and a 7.5% increase on facial tissue. The other major producers—Scott Paper Co. and Procter & Gamble Co.—followed. Scott surprised the market in November by announcing that it was raising its prices for all its towel grades and its paper napkins by 5% to 8%, with the average increase being close to 7%. The hike was to be phased in over a three-month period. Scott is the leading U.S. producer of both towels and napkins.

The announced first-quarter domestic increase on market pulp will cut further into profits and could lead consumer tissue producers to try for another increase on toilet paper and facial tissue in the first half.

Prices: Because of the highly competitive market for consumer tissue paper, the price of tissue paper per ton is available only from the producers. Price trends tracked by the Bureau of Labor Statistics' Producer Price Index (PPI) show relative changes in price levels. Note that this is an index and not a dollar-per-ton price. The PPI for converted sanitary paper products, including unconverted stock (1982 = 100): 1980, 91.9; 1981, 98.2; 1982, 100; 1983, 102.1; 1984, 103.4; 1985, 106.6; 1986, 108.1; 1987, 109.1; 1988 (October), 117.5.

SUPPLY/DEMAND (000 tons)



FORECAST (000 tons)

U.S.	1987	1988e	1989e
Production	5,341	5,471	5,511
Capacity ¹	5,635	5,771	5,900
Utilization rate	94.8	94.8	93.4
Imports ²	55	66	60
Exports ²	36	57	40
Apparent U.S. consumption	5,298	5,480	5,531
lb/capita	43.6	44.6	45.0
GNP ratio	2.75	2.75	2.76

e = Estimate.

1. American Paper Institute data.

2. U.S. Dept. of Commerce data.

TOP U.S. PRODUCERS (000 tpy)

	Annual capacity	Market share (%)
1. James River	1,111	18.8
2. Scott Paper	1,050	17.8
3. Procter & Gamble	900 ¹	15.3
4. Fort Howard	820 ¹	13.9
5. Georgia Pacific	537	9.1
6. Kimberly Clark	430	7.3
7. Pope & Talbot	148	2.5
8. Chesapeake	120	1.7
9. Erving Paper Mills	100	1.7
10. APL	95	1.6

Market share of top five companies:
74.9%

Market share of top ten companies:
90.0%

Total U.S. capacity (1989):
5,900 million short tons

1. P & P estimate.

sion said the trace quantities of the furan 2,3,7,8-TCDF found in disposable diapers do not present a hazard to children.

Testing of milk accelerated. Later this month, the American Paper Institute, represented at the hearing by president Red Cavaney, will submit to EPA a testing protocol for the industry's study of dioxin in milk packaged in solid bleached sulfate (SBS) cartons. The Food & Drug Administration plans to accelerate testing of milk due to the discovery of trace amounts of dioxin in milk sold in Canada. The tests will be conducted early next year at FDA's lab in Chicago, Ill.

Industry can eliminate concerns. API's Cavaney reiterated that he does not know of a commercially available technology, including oxygen delignification, that could manufacture a broad range of bleached paper products that would totally eliminate dioxin formation.

In December, API announced it has identified ways to eliminate any concerns related to dioxin in the manufacture of bleached paper products using a variety of manufacturing process options. Options include removing more of the precursor components in pulp prior to the bleaching process, strictly controlling the amount of elemental chlorine used, substituting other bleaching agents for some chlorine, and installing or modifying prebleaching processes.

• The province of Alberta is introducing environmental standards for pulp and paper mills that are the strictest in Canada. Effective immediately, the regulations require all new or expanding pulp mills to use "leading-edge technology" to control effluents and chemical contamination of the product. The goal is to "reduce dioxins to an absolute minimum and eliminate them if possible," according to environment minister Ian Reid.

New or expanding pulp mills will be required to install equipment that will extend the first delignification stage. They will also have to install oxygen delignification systems and substitute between 60% and 70% of the chlorine with chlorine dioxide in at least the first stage of conventional bleaching. This makes Alberta the first province to require oxygen bleaching equipment, a process that the Swedish Pulp & Paper Research Institute said reduces the formation of dioxin.

CAPACITY

Newsprint capacity growth to hit ten-year high

Capacity increases for some grades of pulp and paper during 1987-90 will be higher than in at least a decade, according to the recently released update of the Canadian Pulp & Paper Assn.'s annual capacity survey. Over the forecast period, market pulp capacity will grow by 2.9% annually, more than twice the rate attained over the 1977-87 period, while newsprint capacity will jump 3.2% annually, higher than recorded in several decades.

Total paper and board capacity in Canada will increase by 2.5 million metric tons and market pulp capacity will rise by 1.135 million tons, each showing a 14.6% growth over the three-year period. Total pulp capacity will grow 9.8%, or 2.4 million tons, during this time.

Strong mechanical pulp growth.

Much of the total pulp growth is the result of gains in mechanical pulping capacity, which will increase at a rate of 6% annually during 1987-90. Four new chemi-thermomechanical pulp (CTMP) mills alone will add 678,000 tons to the total 1.9-million-ton gain

expected over the three-year period. Bleached hardwood sulfate pulp capacity will rise by 300,000 tons by 1990, and bleached softwood pulp will go up 357,000 tons during the survey period. Expansions at four mills in Alberta and British Columbia will account for more than 80% of the increase.

Slow growth for kraft pulp. Most of the gain in market pulp capacity is expected to be in the mechanical grades (mainly CTMP). Mechanical pulp, which represented only 7.3% of Canadian market pulp capacity in 1987, will double to 1.2 million tons by 1990. CPPA noted.

Sulfate market pulp capacity will rise by only 67,000 tons, or 1.0%, over the 1987-90 time frame (excluding Daishowa Paper's 350,000-tpy mill in Alberta, which is not scheduled for completion until 1991). This increase translates into an annual growth rate of only 0.3%/year over the 1987-90 period, compared with 1.5% in 1977-87. Bleached softwood sulfate is expected to grow by 111,000 tons, or a total of 2.0%, while semibleached

Canadian industry annual capacity growth, 1987-90 (000 metric tons).

Year	1987	1988	1989	1990
1987	100	100	100	100
1988	100	100	100	100
1989	100	100	100	100
1990	100	100	100	100
1991	100	100	100	100
1992	100	100	100	100
1993	100	100	100	100
1994	100	100	100	100
1995	100	100	100	100
1996	100	100	100	100
1997	100	100	100	100
1998	100	100	100	100
1999	100	100	100	100
2000	100	100	100	100
2001	100	100	100	100
2002	100	100	100	100
2003	100	100	100	100
2004	100	100	100	100
2005	100	100	100	100
2006	100	100	100	100
2007	100	100	100	100
2008	100	100	100	100
2009	100	100	100	100
2010	100	100	100	100
2011	100	100	100	100
2012	100	100	100	100
2013	100	100	100	100
2014	100	100	100	100
2015	100	100	100	100
2016	100	100	100	100
2017	100	100	100	100
2018	100	100	100	100
2019	100	100	100	100
2020	100	100	100	100
2021	100	100	100	100
2022	100	100	100	100
2023	100	100	100	100
2024	100	100	100	100
2025	100	100	100	100
2026	100	100	100	100
2027	100	100	100	100
2028	100	100	100	100
2029	100	100	100	100
2030	100	100	100	100
2031	100	100	100	100
2032	100	100	100	100
2033	100	100	100	100
2034	100	100	100	100
2035	100	100	100	100
2036	100	100	100	100
2037	100	100	100	100
2038	100	100	100	100
2039	100	100	100	100
2040	100	100	100	100
2041	100	100	100	100
2042	100	100	100	100
2043	100	100	100	100
2044	100	100	100	100
2045	100	100	100	100
2046	100	100	100	100
2047	100	100	100	100
2048	100	100	100	100
2049	100	100	100	100
2050	100	100	100	100
2051	100	100	100	100
2052	100	100	100	100
2053	100	100	100	100
2054	100	100	100	100
2055	100	100	100	100
2056	100	100	100	100
2057	100	100	100	100
2058	100	100	100	100
2059	100	100	100	100
2060	100	100	100	100
2061	100	100	100	100
2062	100	100	100	100

softwood and bleached hardwood grades will decrease by 25,000 and 15,000 tons, respectively, during the three-year period.

Printing/writing surge. On the paper side, newsprint will show major gains in the next three years. Six new machines (including a swing newsprint/groundwood paper machine at Consolidated-Bathurst Inc.'s Grand' Mère, Que., mill), together with some improvements to existing machines, will boost capacity by 1.12 million tons, or 11.3%, between 1987-90 (not included are Kruger Inc.'s 180,000-tpy machine for 1990 or Howe Sound Pulp & Paper's 195,000-tpy machine for 1992).

Groundwood paper capacity is also expected to show significant gains, with a 460,000-ton, or 34%, increase in the three-year period—including St. Marys Paper Inc.'s new supercalendered machine that just started up. Total groundwood paper capacity will reach 1.82 million tons by 1990, up from 1.36 million tons in 1987.

Even more dramatic, though, is the 654,000-ton, or 47%, rise in book, writing, and miscellaneous paper. Total Canadian industry capacity will reach 2.06 million tons by 1990. ■

CONVERTED PRODUCTS

Jefferson Smurfit buys stake in plastic bag firm

Jefferson Smurfit Group plc has acquired a 19.9% stake in PCL Industries Ltd., a leading Canadian producer of plastic carry-out bags and garbage bags, for about C\$8.6 million. Smurfit bought the shares privately from Unicorp Canada Corp. through Smurfit Paper Tube Ltd., Kingston, Ont.

In December 1987, Unicorp called off a hostile \$8/share takeover bid for PCL under a three-year standstill agreement after acquiring a 25% stake in the company. Unicorp still owns about 5% of PCL after selling most of its interest to Smurfit.

PCL's plastics group reported sales of approximately C\$325 million in 1987, and Jefferson Smurfit Corp./Container Corp. of America's plastics packaging division had 1987 sales of about US\$75 million. CCA primarily makes industrial plastic drums and containers, as well as fiber drums, at seven plants. PCL has six manufacturing plants. ■

Weyerhaeuser posts milk carton price increases

Weyerhaeuser Corp. announced a schedule of price increases for converted milk cartons that would raise prices by 9.5% on Jan. 2 and by an additional 6.5% on Apr. 1. The price hikes are generally for the pint, quart, half-gallon, and gallon carton sizes. Prices for half-pint cartons, which are primarily used in school lunch programs, will be raised by 12% on July 1, when supply contracts with schools are generally negotiated.

One marketing source estimates that polyethylene coated milk carton stock prices have jumped by a minimum of \$175/ton over the past year. Export prices are expected to reach \$925 to \$1,025/ton in some regions on Jan. 1, and there is always pressure among the integrated producers to charge equivalent prices to domestic milk carton converting operations. Despite these increasing costs, carton prices have lagged board prices. ■

Three new corrugated box plants in the works

Great Northern Nekoosa Corp. broke ground on a new corrugated box plant in Waxahachie, Texas, in September. The new Nekoosa Packaging plant is expected to start up in mid-1989, bringing GNN's total number of box plants to 26.

• Inland Container Corp. plans to spend \$7 million to modernize and expand production at its Crawfordsville, Ind., box plant. The project, which will be completed in mid-1989, includes an upgrade of the corrugator, an automated conveyor system, and two additional flexo folder-glueers. The corrugator upgrade will increase its width from 87 in. to 98 in. and allow it to run at up to 1,000 fpm. Meanwhile, Inland has purchased a new 80,000-ft² building in Edinburg, Texas, as the site for a new corrugated box plant in the lower Rio Grande Valley. The plant will begin limited operation this spring and will become a full-service box plant by the end of 1989.

• A new 70,000-ft² corrugated container plant has been opened by Gaylord Container Corp. in West Liberty, Iowa. Production was expected to begin in early December. The plant will have multicolor printing capability and advanced diecutting equipment for high-quality graphics. ■

Triangle Industries sale marks major consolidation

Triangle Industries Inc. has agreed to sell its American National Can Div. to France's state-owned conglomerate, Pechiney SA, for \$1.26 billion. New York-based Triangle, which is the world's largest packaging company, was mainly built through the leveraged buyouts of National Can Co. in 1985 and of the packaging unit of American Can Co. in 1986. Triangle operates 111 packaging plants in the U.S., as well as in Britain, Fed. Rep. Germany, France, and Spain, and it reported sales of \$4.4 billion in 1987.

The Triangle sale is the latest in a string of acquisitions of the world's largest packaging concerns and signals a major consolidation in the packaging industry. In November, another French concern, Groupe Car-nard SA, took management control of the packaging activities of Britain's MB Group plc in a \$1.3-billion transaction that will leave the newly formed group, CMB Packaging SA, Europe's biggest packaging concern, with annual sales of about \$3.6 billion. Also in November, the Australian paper and packaging giant, Amcor Ltd., gained a strategic foothold in North America with the acquisition of Canada's Twinpak Inc. ■

PULPWOOD

Export price of Douglas fir chips jumps \$11/bdu

The first-half export price for woodchips moving from the Pacific Northwest to Japan has been settled rather painlessly since both sides are cognizant of the growing demand for woodchips and the shrinking supply, an observer said. The price of Douglas fir chips rose \$11/bdu from second-half 1988 to \$97.70/bdu f.o.b. vessel. The price of red alder chips rose \$6/bdu to \$117/bdu f.o.b. vessel. Besides the strong demand for woodchips from both offshore and domestic pulp mills, woodchips will be in shorter supply since several older, less-efficient sawmills in the region are closing permanently because of rising log costs, sources report.

If the pace of Japan's woodchip imports in first-half 1988 is maintained, it will have imported about 16 million m³ of chips in 1988—a 15.7% increase over 1987 levels, according to a report in Japan's Paper Business Review. ■

Dyestuff industry healthy; higher prices predicted

CONSUMPTION. Although less enthusiastic about growth in 1988 than in 1987, dyestuff producers maintained their upward rise in sales to the paper industry. Paper industry production grew about 4% last year, while paperboard production rose about 2.5%. This contributed to a wider use of brighteners across all grades, while the heavy consumption of deeper shades also increased.

Suppliers are more tentative about 1989. Most are hoping to maintain markets but expect smaller increases. This attitude is fostered by uncertainty in the economy. "Regionally," an industry source explained, "the upper Midwest will see more new and upgraded paper machines in the coming years than any other area, emphasizing that region's importance as a strong, long-term base for paper manufacturing." The printing industry for publication and other grades is centered here for central shipment to the populous coasts. He continued, "New England will likely be a slower growth area due to the relatively high cost of energy and direct competition from Canadian mills." Paper and paperboard production will continue to increase over the next five years. A report from the Canadian Pulp & Paper Assn. forecasts 4.7% capacity growth for Canada, while the American Paper Institute sees a 2.7% increase for the U.S. The capacity growth is fairly well distributed among grades, with printing and writing products leading the charge. This should help dyestuff consumption into the next century. New tissue and toweling machines, such as the one launched by James River in Oregon (276-in., capacity of

70,000 tpy), should also help consumption by the heavy-user group.

FUTURE DEMAND. Another aid to dyestuff suppliers is the use of mechanical fiber as market pulp. Brightness targets are 10% to 20% less than that of chemical pulp, and users may find dyes to be key in the production of grades using bleached chemithermomechanical pulp (BCTMP) and other less-bright fibers. Also, with the government and other public concerns mandating the use of secondary fiber in their consumables, suppliers are looking at product blends and material to perform dual functions in secondary fiber processing.

Mills are also continuing their use of liquid systems for dye introduction in paper furnishes. Powdered dyes now are nearly all used in certain specialty applications and smaller machines. Mills enjoy the flexibility, readiness, and efficiency of liquid systems and apparently do not mind paying higher prices for the more sophisticated products. Material handling suppliers and process control measurement devices bought by mills are seen as contributors to this trend as well. Reporters to this column also see more alkaline papermaking systems now and in the future and have had to adjust their offerings accordingly. Use of cationic direct dyes will increase with every paper machine conversion. New challenges for suppliers and mills may be on the horizon, as types of furnish changes occur in the 1990s. Returnable, multiuse containers are also becoming an important issue in dye sales and consumption.

PRICE, AVAILABILITY. The U.S. dye industry is about to complete a ten-year cycle that will have seen heavy consumption and rapid growth, a massive industry shakeout (which hit U.S. producers hardest), falling prices, recovery, and perhaps, in today's economic environment and industry infrastructure, stability.

Table 1 shows a snapshot of the industry, but statistics are hard to come by. The supply to paper, plastic, textile, and ink manufacturers will be monitored closely, as dye companies want to avoid the problems in the past of overcapacity, dead-end markets, and another shakeout.

Suppliers are positioning themselves for the future. Some will have problems with production due to a lack of intermediary material. The problem has worldwide implications and will always be a serious issue among producers. Many will have to raise prices for this reason. Another reason for future price increases is the environmental pressure facing producers. One plant (Ciba-Geigy's Toms River, N.J., site) will be closed, but the company plans on opening a new facility in St. Gabriel, La. It also reports that the plant will cost \$50 million, with about 20% going to environmental control. BASF is looking to expand U.S. operations, currently searching for a home for a new R&D center on the East Coast.

PRODUCT OUTLOOK. On the product front, Mobay is expanding its Ponolith Supra pigment line and introducing dyes to fill specific needs (i.e., customized products for certain grades, furnishes, and production types). Sandoz Chemical plans new products as well. The company is currently experimenting with a new manufacturing technique for textile dyestuffs. Crompton & Knowles is reintroducing its Intrabond line with a review of 15 products in a new brochure.

—Michael Ducey

TABLE 1: Production and price of dyestuffs.

	1976	1981	1986	1989
Production (millions of lbs)	256	230	236	235
Average price (\$/lb)	2.45	3.50	2.80	3.03
Source: U.S. International Trade Commission; Chemical & Engineering News.				

U.S. PAPER INDUSTRY WILL BE NEAR PEAK PERFORMANCE LEVEL THIS YEAR

High current operating rates and weak U.S. dollar are sources of strength as post-Reagan era begins; record capital spending planned

The U.S. paper industry achieved record production and earnings in 1988, and further gains are expected in 1989 despite a potential slowdown in overall economic expansion. Paper company executives and financial analysts responding to *Pulp & Paper's* annual survey acknowledge their concerns about the U.S. budget and trade deficits, rising interest rates, and international competitiveness, but the fundamental strengths of the paper industry are expected to more than offset these concerns in 1989.

As a result, paper industry management will step up capital spending programs to a record \$11.5 billion in 1989, supported by continued strong earnings and cash flow. A similar capital spending boom is under way in Canada, where pulp and paper companies are planning to spend near the record C\$3.8 billion expended in 1988.

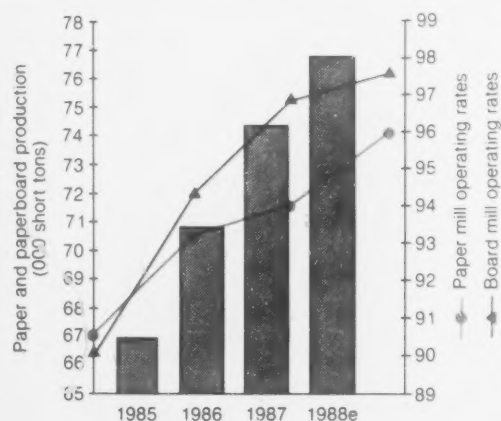
Outlook '89 was prepared by Pulp & Paper news staffers Noel DeKing in New York and Regina McGrath, Debra Garcia, Rob Galin, and Will Mies in San Francisco.

Capital spending is focused on cost reduction, improved quality and machine flexibility, and low-cost incremental capacity additions, rather than greenfield capacity additions. In Canada, several new greenfield projects are scheduled for Alberta and British Columbia based on large foreign investments in the domestic pulp and paper industry.

North American capacity growth of 3% in 1989 will be distributed across all grades but concentrated in pulp, newsprint, printing/writing paper, and linerboard. Capacity increases do not appear to be excessive yet, except for newsprint. A looming oversupply of newsprint has already given U.S. newspaper publishers the clout to postpone newsprint price increases originally scheduled for the first of the year. Most other grades were capacity constrained in 1988, so incremental additions coming online this year should not tip the balance to oversupply and prices should remain stable.

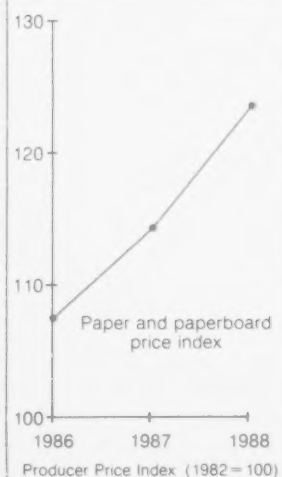
However, some grade segments, such as linerboard, showed signs that supply may be catching up with de-

Strong demand caused U.S. mills to reach record production levels...



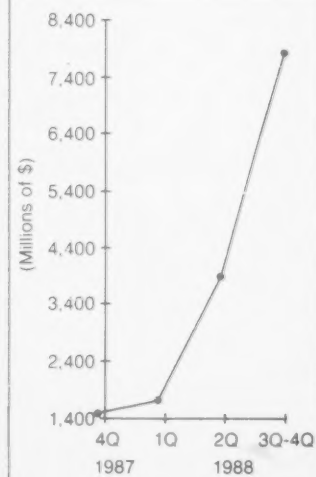
Source: American Paper Institute.

...causing prices to rise...



Producer Price Index (1982=100)
Source: Bureau of Labor Statistics.

...and lifting profits.



Source: Dept. of Commerce.

mand. And some analysts worry that if market conditions remain strong in 1989, companies may begin to tip the scale toward overexpansion in more grades besides newsprint. In market pulp, for example, there is a list of major projects scheduled for startup in the early 1990s.

MILD RECESSION. However, most industry watchers are preparing for the effects of a mild recession beginning in second-half 1989. "The key questions in a recessionary period are, What will happen to operating rates? and What will happen to prices?," said John Fery, Boise Cascade Corp president and CEO. Fery believes that operating rates for most grades will remain at 92% or above, a level at which pricing generally tends to remain stable. On the whole, the consensus P&P forecast calls for operating rates to average 94.8% for paper grades and 96.1% for paperboard grades in 1989, compared with 95.8% and 97.2% for paper and paperboard, respectively, in 1988. The tightest grades are likely to be market pulp, linerboard, and bleached board, while the weakest grades are likely to be tissue and coated printing paper.

In 1989, paper industry output is forecast to increase 2.3%, about equal to the 2.4% rate of growth of GNP. This is a notable slowdown from 1988's 3.5% gain in industry output and the general economy's 3.8% growth. Nonetheless, these gains should be sufficient to carry indus-

try earnings higher in 1989, supported by higher prices for most grades. "Pricing for our major products continues to improve, which is characteristic of an operating climate where demand is pushing the limits of supply. Given this scenario, we expect to establish new records for sales and earnings in 1989," said Roger Stone, president and CEO of Stone Container Corp. Overall, paper company profits are forecast to advance by 11% in 1989 after rising nearly 60% in 1988.

Most analysts believe that 1989 will mark the peak of the paper industry earnings cycle, and they have turned their attention to what the bottom of the cycle might look like. "The long-term profitability of the industry will be enhanced by the benefits of several years of capital spending focused on cost reduction and U.S. producers' enhanced competitive position in world markets," said Mark Diverio of Shearson Lehman Hutton. "These underlying improvements will become evident in the next downturn, when the earnings decline may be only half of past cyclical declines," he added.

PRICE TRENDS. Paper and paperboard prices are expected to increase in early 1989, due mostly to the carryover effect from price increases that were implemented in second-half 1988. "By Apr. 1, we expect price increases to be implemented for market pulp, coated groundwood and uncoated free-sheet paper, some spe-

TABLE 1: Analysts' projections for 1989.

	Percentage change from 1988 levels (unless otherwise indicated)									
	Growth in real GNP	Paper/board production	Operating rates ¹		Prices	Costs per unit output ²	Paper	Earnings Forest products ³	Housing starts ⁴	
			Paper	Paperboard						
George Adler										
Smith Barney	3.1	2.4	94.9	96.6	5.0	3.0	15.0	9.0	1.37	
Evdna Lynn										
Merrill Lynch	2.2	2.1	96.2	96.2	5.0	3.0	4.6	8.3	1.34	
Mark Kurland										
Mabon Nugent	2.1	2.0	95.0	96.0	0	2.0	10.0	5.0	1.30	
Lawrence Ross										
Paine Webber	2.5	1.0-2.0	94.0	96.0	6.0	3.0-4.0	15-20	12-15	1.40	
Thomas Farrell										
Deutsche Bank	2.5-3.0	3.0	96.0	97.0	4.0-6.0	1.0-2.0	20	10	1.20	
William Wigder										
First Boston	2.5	2.5	95.0	96.0	3.0-5.0	2.0	15.0	0	1.40	
Chad Brown										
Drexel Burnham Lambert	2.8	3.5	93.5	95.0	5.0	4.5	15.0	10.0	1.32	
James Wei										
Tucker Anthony	0	2.0	94.0	97.0	3.0	5.0	(12.0)	(4.0)	1.25	
Tom Clephane										
Jeanne Carroll										
Morgan Stanley	3.0	2.2	95.1	95.4	6.4	4.5	15.0	(25)	1.35	
Mark Diverio										
Shearson Lehman Hutton	2.6	2.0	94.7	96.1	3.5	3.0	12.0	17	1.38	
Average	2.4	2.3	94.8	96.1	4.3	3.2	11.2	4.4	1.33	

1. Production as percent of capacity.
2. Weighted for full year.
3. Estimates may include.
4. Millions of units.

1. Production as percent of capacity. 2. Weighted for full year. 3. Estimates may include. 4. Millions of units.

TABLE 2: Industry operating rates.

Paper	Operating rates (%)				
	1984	1985	1986	1987	1988e
Newsprint	94.7 %	93.8 %	97.0 %	98.3 %	99.3 %
Uncoated groundwood	91.8	89.0	91.4	84.6	86.7
Coated paper	95.3	88.2	92.9	93.1	96.9
Uncoated freesheet	91.0	92.2	94.4	95.3	96.6
Bristols	91.9	87.8	96.6	98.0	98.0
Thin paper	89.6	80.4	79.2	81.2	71.5
Cotton paper	81.2	77.0	79.2	82.6	82.2
Kraft and industrial	91.8	87.0	88.9	90.7	92.0
Tissue	93.3	92.4	93.1	94.1	95.1
Total paper percent	92.8%	90.5%	93.2%	94.0%	95.8%
Paperboard					
Kraft Linerboard	96.8 %	90.7 %	95.5 %	99.9 %	100.1 %
Other kraft	90.4	84.3	88.9	87.2	83.4
Total	96.4%	90.2%	95.0%	98.9%	98.8%
Semichemical	98.4	94.0	96.7	96.7	99.3
Bleached board	96.7	90.3	93.3	94.5	96.6
Recycled	87.6	86.8	89.7	91.9	93.9
Total paperboard percent	94.6%	90.0%	93.8%	96.8%	97.2%
Total paper and paperboard percent	93.7%	90.2%	93.5%	95.4%	96.5%

e= Estimates.

Source: American Paper Institute.

TABLE 3: Industry production.

Paper	Production (000 tons)				
	1984	1985	1986	1987	1988e
Newsprint	5,539	5,428	5,630	5,842	5,971
Uncoated groundwood	1,565	1,521	1,540	1,485	1,617
Coated paper	6,249	5,875	6,263	6,860	7,410
Uncoated freesheet	9,152	9,690	10,410	10,977	11,379
Bristols	966	930	990	1,044	1,130
Thin paper	303	262	247	251	221
Cotton paper	147	144	152	163	162
Kraft and industrial	5,586	5,204	5,117	5,072	5,207
Tissue	4,921	4,941	5,095	5,301	5,488
Total paper	34,428	33,995	35,444	36,994	38,585
Percent change	5.0%	1.3%	4.3%	4.4%	4.5%
Paperboard					
Kraft Linerboard	16,038	15,183	16,402	17,682	18,084
Other kraft	1,147	1,185	1,287	1,232	1,272
Total	17,185	16,368	17,689	18,913	19,356
Semichemical	5,169	5,088	5,376	5,600	5,707
Bleached board	4,048	3,948	4,271	4,420	4,508
Recycled	7,637	7,630	8,083	8,506	8,873
Total paperboard	34,039	33,034	35,419	37,439	38,427
Percent change	5.8%	2.9%	7.2%	5.7%	2.6%
Total paper and paperboard	68,467	67,029	70,863	74,433	77,012
Percent change	5.8%	2.9%	7.2%	5.7%	2.6%

e= Estimates.

Source: American Paper Institute.

cialty paper, bleached paperboard, and clay-coated recycled board. These are likely to be the only price increases that are fully implemented this year," stated Merrill Lynch analyst Evadna Lynn. Exceptions to these general price increases at the beginning of 1989 would include linerboard, tissue, newsprint, and coated papers, for which pricing problems are anticipated. Customer resistance to higher market pulp prices is also foreseen. This should result in an average industry price increase of 4% to 6% in 1989, which compares with an average price increase of 12% in 1988.

If a weakening economy leads to price discounting in the second half of the year, the impact on earnings may not be as severe as in previous downturns because the customer inventories are low and the industry is more concentrated. "For many grades of paper there are now fewer producers. A more oligopolistic structure could mean less price cutting in the next downturn," said Chad Brown of Drexel Burnham Lambert.

On the cost side, inflation in unit costs is likely to be higher in 1989 but will still be lower than the assumed rise in average prices. Wood costs are likely to rise sharply because of the reduction in chip supply as lumber production declines, particularly in the Pacific Northwest. Labor cost inflation will continue at a moderate pace, while chemicals will increase at a slower pace than in 1988. Depressed oil prices will keep energy costs down this year. Industry costs are forecast to rise an average 3.2% in 1989.

Interest rates are headed upward as the Federal Reserve Board has repeatedly

raised the prime rate to slow inflation. Most analysts expect a further 1% to 2% increase in interest rates before they decline. One scenario calls for the 30-year Treasury bond rate to reach a peak of 9.3% in the first quarter. The Fed adheres to the theory that inflation is primarily the result of excessive growth in the money supply. Some members of the Fed's policy-setting committee have warned that they will push up interest rates if the U.S. economy grows faster than about 2.5%. The National Assn. of Business Economists forecasts that the economy will grow at about the 2.5% level and inflation will creep up to a 5% annual rate in 1989, compared with 4.1% in 1988.

Higher interest rates will push housing starts down to 1.3 million units in 1989, leading to lower operating rates and deteriorating prices and earnings for lumber and wood products operations. The wood products business began a cyclical decline last year after peaking in 1987, and further declines are forecast this year. Lumber and plywood prices are currently weak and close to the break-even level for sawmills in the Pacific Northwest and British Columbia. The industry currently has excess capacity, so some mill shutdowns are anticipated. Lumber exports should remain strong, but volumes are insufficient to offset weakness in the huge U.S. market.

WEAK DOLLAR. The weak dollar has given U.S. producers a manufacturing cost advantage when selling pulp, linerboard, and other products in overseas markets. A further 2% to 3% decline in the dollar is expected in 1989, and this could lead to higher export volumes. In 1988, pulp exports jumped 12.3%; paper grades, mostly newsprint, rose 18%; and paperboard grades, mostly linerboard, increased just 3.4%. The modest gain for the paperboard grades resulted because production of these grades was strained to meet domestic demand, although a drop-off in orders from China hurt linerboard exports in second-half 1988. In fact, exports of bleached milk carton board, one of the industry's most attractive opportunities, were actually down last year because producers diverted production to meet domestic demand. Nonetheless, a number of producers are increasing their marketing efforts, developing joint ventures, or increasing production capacity to become long-term players in world markets. "It seems that export participation will be one of those things that is company specific rather than industry wide," commented Lawrence Ross of Paine Webber.

On the import side, shipments of newsprint were flat but printing/writing grades, mostly uncoated groundwood, jumped 17.5% in 1988. The U.S. continues to attract imports in the printing/writing grades because the domestic industry is running at capacity, demand is high, backlogs are building, and the customer base is reaching offshore for additional supplies. Most of these imports are supplied by Canada, which accounts for 75% to 80% of foreign shipments to the U.S. The reduc-

tion of U.S. tariffs on Canadian imports, which is scheduled to begin this year, could lead to even higher volumes from Canada.

INDUSTRY STRUCTURE. Although the major share of industry restructuring and consolidation has already occurred, the trend will continue, albeit at a slower pace. Paper companies have begun to attract greater interest among foreign investors, noted Shearson's Diverio. Besides Japanese firms that have acquired stakes in U.S. and Canadian paper and forest products companies, investment capital has also flowed in from the U.K., Australia, New Zealand, France, Finland, and Kuwait. In addition, takeover speculation surrounded Mead Corp., Bowater Inc., and Kimberly-Clark Corp. last year. In a related development, the management of Fort Howard Corp. took the company private in a leveraged buyout transaction.

Further restructuring will likely occur in light of the industry's favorable prospects, cheap stock valuations relative to inherent earning power, and a surplus of foreign capital and excess cash flow that are available for acquisitions.

UNCOATED FREE-SHEET

NEW CAPACITY MAY CAUSE SOFTENING

■ Rising demand for office and business papers is expected to continue to push up demand for uncoated free-sheet grades and encourage higher production levels at U.S. and Canadian paper mills. This strong demand will help keep mill operating rates in 1989 above the 97.0% estimated for 1988.

Strong consumption rates will be seen in major end uses (such as office bond, forms bond, reprographic, tablet, and envelope), printing papers (offset, cover, and text), and miscellaneous (such as technical, papeterie, or colored school).

But capacity also is going to rise substantially, and mills seem to be announcing new, "world class" machines of 250,000 to 300,000 tpy on a regular basis. Among these are Union Camp Corp., Georgia-Pacific Corp., and Boise Cascade Corp. Additional machines may be installed by Great Northern Nekoosa Corp., Bowater Inc., and Weyerhaeuser Paper Co. Still, all this potential new capacity is expected to be in relative balance with demand.

North American mills are continuing to expand with ever-larger paper machines. A number of mills have announced new installations for units that can produce 300,000 short tpy or more. These include Georgia-Pacific, Boise Cascade, and possibly Great Northern Nekoosa at Ashdown, Ark. Slightly smaller machines are on tap for Union Camp, Willamette Industries Inc., and possibly Weyerhaeuser and Bowater.

Startup of new, larger machines has gone quite well in most cases. The 290,000-tpy uncoated machine at Georgia-Pacific's Port Hudson, La., mill was reportedly running at 65% of rated capacity less than two months after startup. Weyerhaeuser Canada Ltd.'s 210,000-tpy alkaline communications papers machine at Prince Albert, Sask., reportedly has also been running quite well.

Canadian printing and writing paper capacity is expected to rise 16.5% in 1989 from 1988, according to the recently released Canadian Pulp & Paper Assn. capacity survey. Roughly 30% of total printing/writing capacity, not including uncoated groundwood papers, is coated; the rest is uncoated free-sheet grades.

Canadian printing/writing capacity will reach about 1.773 million metric tons in 1989, according to the CPPA report. Another 15.9% increase to 2.055 million metric tons will occur in 1990, CPPA said.

HIGH OPERATING RATES. Operating rates at uncoated free-sheet mills are expected to remain between 93% and 96% or higher in 1989. Many analysts are predicting two- or three-percentage-point declines in second-half 1989, primarily due to an expected economic downturn that some even call a recession. Production could reach nearly 12 million tons this year, according to Merrill Lynch analyst Evadna Lynn. The uncoated business papers segment may run at better than 97%, if Morgan Stanley analysts are correct.

On a slightly more pessimistic side, First Boston's William Wigder puts 1989 production at more than 13 million tons, with operating rates a low 92.9%. Roger Ashby of Domtar Inc. told an industry gathering that North American growth for uncoated white papers may be just 2.0% to 2.5% this year.

Demand will remain relatively strong through the first half of next year. However, inventory building in response to announcements of price increases may slow some orders. After jumping roughly 40% in 1988, imports into the U.S. may show further growth this year, even with the decline in the dollar, according to some observers.

All grades of uncoated free-sheet paper underwent price increases in 1987 and 1988. The increases brought the commodity grades, such as forms bond and offset, to levels at or above their highs of 1984. The market was experiencing slight softening, but most buyers and sellers expected the latest increases to hold and paper to sell near list prices. A few mills producing reprographic and other cut-size bond grades have announced \$40/ton price increases for January.

Forms bond producers raised their list prices by \$50/ton for shipments on Oct. 1 or Oct. 3. The increase put 15-lb forms bond at about \$910/ton. Related paper grades rose, including one-time carbonizing (OTC) tissue, which increased about 5% to 6% on Oct. 17. Forms bond, which sold for \$753/ton list in 1981, dropped in 1985 to \$600/ton but then began a steady rise again.

EXPANDING MARKETS. The best markets for uncoated free-sheet grades are bond, mimeo, duplicating, and reprographic, which account for 24%; forms, 21%; offset printing, 25%; envelope, 11%; tablet, 4%; carbonless, 6%; and other, 9%.

Slightly more than 2.7 million tons of uncoated offset paper were produced in the U.S. in 1987. Shipments to book publishers were 560,000 tons, or 60% of the 930,000 tons of paper shipped to book publishers. In contrast, uncoated groundwood represented 7.5%, and the coated grades accounted for 32%.

Consumption of uncoated free-sheet paper for books rose 25.2% from 1982 to 1986, compared with the 24.9% gain made by coated papers and the 15.8% loss by uncoated groundwood grades. However, uncoated free-sheet experienced a small 1.7% decline from 1986 to 1987, while coated gained 1% and uncoated groundwood almost 2.5%.

Shipments of offset and other uncoated free-sheet paper to commercial printers gained more than 8% in 1987 from 1986. This compares with coated, which gained more than 15%, and uncoated groundwood, which lost 14%.

Demand for cover and text grades has grown by about 4.1%/year since 1980, reaching somewhere near 300,000 tons in 1987. Text papers represented about 65% of this market, at over 190,000 tons, in 1987.

In the bond, mimeo, duplicating, and copy grades, the paper shortage last year caused some mills to produce the higher-value reprographic and cut-size grades at the expense of forms bond, adding to a forms shortage.

Use of computer printers is expected to continue to grow as a major market for cut-size bond and copy papers, though forms bond growth may slow. Richard Norton, director of Imaging Supplies Industry Services and Copying & Duplicating Industry Services for Dataquest Inc., forecasts overall demand growth for cut-size papers used for computer printers and copy machines at 20.6%, from 393,000 tons in 1986 to 1 million tons in 1991. Most of this paper is uncoated free-sheet.

Page (laser) printers accounted for about 288,000 tons of cut-size paper in the U.S. in 1986, and this number will rise to 786,000 tons by 1991. Copier paper will post 4.0%/year growth between now and 1991, Norton said. That is slightly under 2.0 million tons in 1986 to almost 2.4 million tons in 1991.

Use of stock continuous forms will grow at 7%/year, from 1.7 million tons in 1986 to 2.4 million tons in 1991, according to Norton. Its sister paper, custom continuous forms, will show practically zero growth over these five years.

Of all paper shipments in 1987 to U.S. business forms converters, uncoated free-sheet bond represented 92%, or 2.8 million tons. In comparison, uncoated groundwood, at 228,000 tons, made up the balance, except for coated bond (0.2%). The groundwood segment began to decline at the beginning of the 1980s, falling about 4.5%

between 1982 and 1986, and dropped another 6% in 1987. At the same time, uncoated free-sheet for forms rose almost 44%, gaining an additional 3% in 1987.

Also used in multipart continuous forms is carbonless paper. Basestock for carbonless coating represents a market of almost 600,000 tpy, having grown almost 45.4% from 1982 through 1986 and over 10% from 1986 to 1987. In contrast, OTC production was just under 110,000 tons in 1987, down more than 7% from 1986. Carbonizing tissue can be groundwood paper. A major converter expects carbonless papers to move from 45% of the multipart forms market to 60% in several years.

COATED PAPERS

DEMAND WILL ABSORB NEW CAPACITY

■ Paper industry analysts expect coated paper markets to remain relatively strong in 1989, enough so that demand will absorb new capacity. These advances will be based on increased demand from such end-use markets as magazines, advertising inserts and flyers, catalogs, and other commercial printing.

This means that operating rates at coated mills probably will average about 95.5%, slightly higher than 1988's estimated average utilization of 95.3%. Most analysts see these figures getting even better in succeeding years.

Overall consumption of coated paper grades may rise by 4.0% over 1988, a year that saw an exceptional 8.1% estimated growth in consumption of all paper grades, according to Goldman Sachs analysts Bruce Kirk and John Chrysikopoulos. Consumption growth in 1990 may advance another 4.8%. These healthy markets have allowed producers to raise prices beyond the high levels set in 1984-85.

Merrill Lynch analyst Evadna Lynn forecasts apparent U.S. consumption of coated groundwood papers to rise from an estimated 4.7 million tons in 1988 to almost 4.8 million tons this year, with a 3% increase in 1990. This will bring down the operating rate from 99.4% last year to 98.6% in 1989 and 97.4% in 1990, Lynn said. First Boston analyst William Wigder forecasts 6.0% average annual growth in coated free-sheet production and 6.1% growth in capacity.

Producers of coated groundwood papers continue to benefit from an improving magazine market and a very healthy commercial printing sector. Magazines reported selling 3.1% more advertising pages in 1987 than in 1986, the Publishers Information Bureau said.

For coated free-sheet grades, Lynn expects consumption to increase 3.1% from last year to just over 3.5 million tons in 1989. By the end of 1990, consumption may hit almost 3.8 million tons. Operating rates for coated free-sheet mills will decline from 96.4% in 1988 to 94.4% this year but will jump back to 96.8% in 1990.

Overall coated paper demand probably will continue to grow somewhat above the real GNP in the next few years.

Magazine publishers did better than expected in 1988. A possible economic downturn and higher advertising rates could hurt paper sales to these publishers, but most analysts still expect some moderate growth in this sector. In fact, Mead Corp.'s Robert C. Eisenach said at a recent conference that the company expects magazine growth of 2.5% on average over the five years through 1992. Magazines will use 51% of the coated groundwood and 18% of the coated free-sheet paper produced.

CATALOGS STILL GROWING. The catalog business also has been growing rapidly. Demand for catalogs is increasing dramatically, according to the Direct Marketing Assn. Simmons Market Research said that 51.2% of the U.S. population (87.7 million Americans) shops by mail, a 15% increase from 1985. Actual catalog production rose 18% in 1986, representing 11.8 billion pieces from about 6,500 publishers. Demand for coated papers for catalogs could reach over two million tons by 1990.

Mead forecasts catalog growth of 7.0% through 1992, of which 23% is coated groundwood and 31% coated free-sheet.

Another major market is commercial printing, which uses about 53% of all coated paper production, according to Eisenach. Some 2.9 million tons of coated paper went into that sector in 1987.

Included in that market are direct mail flyers and newspaper advertising inserts. Preprinted newspaper inserts are growing at an estimated 5% to 7%/year, with coated paper usage for inserts to rise from about 400,000 tons in 1986 to 600,000 in each of the four following years. The rest of the approximately 2 million tons of insert paper is newsprint or uncoated groundwood grades.

About 300,000 tpy of coated paper went into the book market in each year from 1984 through 1987. Demand may grow as much as 5%/year in the next one or two years. Eisenach said books should advance by about 2.0%. Just 9% of coated production is used by book printers and publishers.

Demand for coated papers in the 1990s is expected to be healthy, jumping to somewhere near 10 million tons in the U.S. alone. Canadian demand will reach several million tons. This means that imports into the U.S. also will rise, with Scandinavia, Fed. Rep. Germany, and Canada being the major suppliers. Canada will also see imports from Europe, Scandinavia, and the U.S.

The coated paper industry has recognized that one threat to coated paper is supercalendered (SC) paper. Premium SC papers usually are offered for sale at \$100/ton less than lightweight coated. Other threats come from high-brightness uncoated groundwoods and the new Scandinavian lightly pigmented grades that fall between SC and coated groundwood.

TISSUE

WILL PRICE HIKES STICK?

■ Last year, producers of consumer tissue implemented their first increase on roll tissue products in about seven years. In April, James River Corp. led the price increase attempt by announcing increases of 9.2% on toilet paper, 5.6% on towels, 5.0% on napkins, and 7.5% on facial tissue. Scott Paper Co. and Procter & Gamble Co. followed.

Producers did not intend the increase to truly take effect until June, but they ended up waiting until September-October to implement the hike. The long lag time is indicative of how competitive the consumer tissue market is: producers delayed implementation by offering special deals and discounts to maintain market share, and they did not get the full amount of the increases.

In November, Scott Paper Co. announced it was raising its prices for all its towel grades and its paper napkins by 5% to 8%, with the average increase being close to 7%. The hike was to be phased in over a three-month period.

Scott's announcement came when producers had just implemented the hike led by James River. This highlights the extreme margin pressure consumer tissue producers have been subject to in the form of rising pulp and secondary fiber prices. Consumers will no longer accept fewer sheets on the roll, and price increases are the only way for producers to pass on these costs. With Scott's sale of its stake in Brunswick Pulp & Paper Co., all of the U.S. consumer tissue producers are net buyers of pulp. The problem is that consumer tissue producers are tempted to offer discounts that erode their margins to maintain market share, so announced price hikes can become meaningless.

Early this year, the tissue market will be trying to absorb the 70,000 tpy of new capacity that came onstream in late 1988 at James River's Clatskanie, Ore., mill. Several new machines are slated for startup in the second half of this year (Table 6), but the additional capacity shouldn't have much of a downward effect on prices until the fourth quarter.

What will endanger the price increases in both the consumer and the commercial and industrial (C&I) market is a slowdown in the economy. Although consumers continue to buy tissue products in a recession, they may trade down to lower-quality products or to private-label products. C&I producers have more to lose in a recession since demand for their products is more closely linked to industrial production.

C&I MARKET. Producers of C&I tissue—Fort Howard Corp., James River, Scott, and Georgia-Pacific Corp.—implemented two price increases in 1988: a 5% increase in the spring and a 6.9% increase in the fall. Industrial tissue merchants feel the market cannot bear another increase in spring 1989, but producers could try

for another hike during the first half since tissue capacity will be fairly tight then. Producers generally get about half of the announced price hikes, so they have raised prices about 12% during 1987-88.

Besides jockeying for market share in Europe, James River and Scott Paper are investing in their pulp and fiber supply. James River plans to raise its U.S. pulp capacity by 350,000 tpy through incremental capacity expansions at existing mills, and it is also expanding deinking capacity at one mill. It also has an indirect equity interest in Aracruz Celulose SA of Brazil, which is doubling its eucalyptus kraft pulp capacity.

Last year, Scott bought 20% of the Papeles Sud America mill in Nacimiento, Chile. About \$200 million is being invested in the mill to convert it to making eucalyptus pulp. Startup is slated for 1990, and Scott Worldwide will be a major customer. Toward the end of last year, Scott announced it will spend over \$50 million to expand tissue capacity in the Malaysia, Thailand, and Taiwan. Scott is the leading tissue producer in these markets.

CONTAINERBOARD

SUPPLY CATCHING UP WITH DEMAND

■ Containerboard producers enjoyed another healthy year in 1988, even though the linerboard market showed some signs of easing in the fourth quarter. Nevertheless, corrugated box shipments for the year were up approximately 3%, linerboard mills operated at around 97% of capacity, and industry profits surged again to record-high levels.

The loosening in the market last fall reflected slower growth in U.S. box shipments combined with lower-than-expected linerboard export shipments. After increasing 3.8% in first-half 1988, corrugated box shipments in the third quarter grew only 1.5% from a year ago. Meanwhile, linerboard export shipments for the year were expected to be relatively flat at around 2.3 million short tons.

The main reason for the poorer-than-expected performance for linerboard exports was a drop-off of about 40% in shipments to People's Rep. China, which purchased heavily in 1987. Excluding mainland China, U.S. exports would have been up about 6% last year, Thomas P. Clephane of Morgan Stanley noted in a recent speech given to Pulp & Paper's Third International Unbleached Kraft Conference in Atlanta, Ga.

Another factor that probably caused the market to soften was faster-than-expected capacity growth caused by a large number of incremental expansion projects. These projects typically involve wet end rebuilds, addition of high-pressure presses, and additional fiber (either from debottlenecking the existing kraft mill or adding a secondary fiber line).

A total of more than a dozen major rebuilds will be completed during 1988-89. Nickey J. Rudd, vice president of BE&K Engineering Co., told the same conference. As a result of such projects and operating improvements, U.S. linerboard capacity may be expanding at a 4%/year pace over the 1988-91 period. Victor Casebolt, senior vice president of International Paper Co., told customers last year. As a result of these trends, indications in second-half 1988 suggested that industry linerboard supply had caught up with—and had slightly exceeded—demand.

One indication was rising containerboard inventories at box plants and mills, which hit a high of 2.724 million tons at the end of September (equal to 6.2 weeks of supply). Another indication was growing discounting by U.S. mills—particularly some weaker producers—in export markets in the fourth quarter. According to some estimates, linerboard export prices by the end of the year were about \$20 to \$30 below the domestic U.S. list price of \$410/short ton.

TIME FOR A PRICE INCREASE? By late last year, the soft market conditions were causing considerable uncertainty as to whether producers would be able to push through a \$40/ton linerboard price increase in first-quarter 1989. By mid-December, only about four producers had joined the increase, which would take the domestic list price of linerboard to \$450/ton in January.

However, there were still some indications that producers might be successful in raising prices sometime in the first quarter. The economy and corrugated box shipments remained fairly strong in fourth-quarter 1989 (with October box shipments up 4%), and this was expected to carry over into early 1990. Inventories of containerboard at box plants and mills by Nov. 1 had dropped back down to 2.532 million tons, or 5.3 weeks of supply (the lowest level all year in weeks).

The drop partly reflected accelerated maintenance downtime and rebuilds at U.S. mills in November and December, which eliminated more than 150,000 tons of potential production, according to some estimates. Not surprisingly, analysts are mixed on the containerboard industry's outlook for 1989. Clephane expects corrugated box shipments to grow by 2.7% this year, based on a 3% growth in real GNP and a 3.7% rise in industrial production. In 1990, he expects zero economic growth due to a moderate recession, which would result in flat box shipments. Export linerboard shipments are expected to increase by about 4%/year in 1989 and 1990.

Linerboard mill operating rates are expected to average 94.7% in 1989 and 92.8% in 1990—"well above the 93% to 94% range that normally defines a seller's market." As a result, Clephane believes producers will be able to push through a \$30/ton increase in prices effective Mar. 1, which will help the linerboard industry achieve a 16% increase in average operating income in 1989.

BOXBOARD

FLAT GROWTH TREND EXPECTED

■ Boxboard producers should enjoy steady markets for bleached, recycled, and unbleached kraft paperboard in 1989, led by exports and folding cartons. Capacity additions will be limited to machine rebuilds, so even a slight decline in demand for the packaging grades will not lower operating rates significantly.

Production of bleached board was up only 2% in 1988 after advancing 12% in 1986-87. The supply of bleached board was limited in the first half of the year due to a series of scheduled downtimes at solid bleached sulfate (SBS) mills, leading some mills to initiate customer allocation. As much as 100,000 tons of production capacity was lost in 1988, according to several industry executives. Most of the supply shortfall was in the milk carton grades, which sharply curtailed exports. SBS folding carton markets were also tight most of the year, but production rebounded in the second half as more supply became available.

Recycled paperboard production increased about 4% in 1988, led by strong folding carton and industrial packaging markets. Recycled mills producing clay-coated folding carton stock reported strong orders throughout the year due to the shortage of SBS board and the increasing price differential with SBS. During the third quarter, 15-pt SBS was selling for about \$675/ton, while 20-pt clay-coated newsprint (CCN) was selling for \$445 to \$465/ton. Markets for gypsum linerboard, corrugating medium, and tube and can stock were also strong as the country's industrial output and construction activity escalated.

Unbleached kraft boxboard production increased approximately 5% in 1988. Most of the coated kraft board produced by Mead Corp. and Manville Corp. is used in the beverage carrier market, where the increased use of multi-packs and exports has spurred growth. At the same time, both producers have expanded their folding carton business, where coated kraft board competes with SBS and CCN. Prices of coated kraft board fall between these two grades, and 20-pt folding carton board was selling for about \$520/ton in the third quarter.

STRONG PRICE ADVANCES. In 1988, bleached board producers increased prices by \$40/ton in April and \$55/ton in September, raising the price of 15-pt SBS in rolls to \$730/ton at year's end. Because the SBS market was tight throughout the year, producers had considerable leverage in implementing these price hikes. For 1989, producers will attempt a \$50/ton price increase in early January when market conditions are still expected to be favorable. If the January increase is successful, it may represent a peak in SBS prices if markets weaken later this year.

The sharp upswing in SBS prices has been spurred by

surging pulp prices. Historically, market pulp prices and SBS prices move in sequence since SBS is a type of value-added bleached pulp. Producers of both bleached pulp and SBS try to maintain a premium price for the board, but in 1988 pulp prices were approximately even with SBS prices. This price trend led to increased production of market pulp on swing machines in 1988, thus further reducing available SBS capacity.

Recycled boxboard producers were equally aggressive in 1988 and increased prices of folding carton board three times during the year. As a result, prices for 20-pt CCN increased from about \$400/ton at the beginning of the year to approximately \$500/ton at year's end. Prices vary \$10 to \$15/ton for producers in the East and Midwest based on different wastepaper costs, and they also vary by the basis weight and quality of the multi-ply boards manufactured by various producers.

Most producers of recycled chipboard and setup boxboard also raised prices in 1988. These industrial grades are used in the manufacture of rigid boxes, composite cans, tubes and cores, and various diecut products. Prices range from a low of about \$250/ton up to \$450/ton for specialty grades.

OUTLOOK IS STEADY. Demand for boxboard grades is expected to remain steady in the consumer packaging markets in 1989, but some weakness may occur in the industrial packaging grades. Total SBS production should remain at the 4.5-million-tpy level, with folding carton, milk carton, and other packaging grades remaining near their 1988 levels. Recycled and unbleached kraft folding carton production is expected to gain slightly as these grades find greater acceptance in the marketplace. Recycled folding production should increase about 2% to 2.5 million tpy, and kraft board production for both cartons and carriers will increase about 3.5% to 1.1 million tpy. Operating rates for all grades should run at 94% or above in 1989 since capacity additions will largely be limited to productivity improvements rather than capital expansions.

Most of the planned capacity expansions for the boxboard grades will come online after 1989.

WASTEPAPER

PRICES FALLING OFF

■ Most of 1988 was a sellers' market for wastepaper. Mills found themselves paying historically high prices for pulp substitutes as these prices kept pace with increases in market pulp. High operating rates in all paper grades bolstered demand for the lower grades of paperstock. In contrast, 1989 doesn't hold promise of being another record year. The wastepaper market is a good litmus test for the health of the industry, and the first hints of a recession will be felt here first.

The anticipated first-quarter increase on hardwood and softwood market pulp should bring a modest increase in the price of hard white envelope cuttings and hard white shavings. Most observers don't expect these prices to continue the upward spiral they were on for most of 1988, however. Deinking stocks were in high demand in 1988 as more mills traded down to these grades and installed additional secondary fiber lines to shield themselves from high pulp substitute prices. Startup of FSC Paper Co.'s 80,000-tpy recycled tissue machine later this year and of a similar-size machine at Fort Howard Corp.'s Rincon, Ga., mill will help keep demand for these grades strong.

Increased use of laser printers is generating a growing supply of laser-printed computer printout (CPO) paper. Kimberly-Clark Corp. continues to buy 100% laser-printed CPO to supply a new plant it built in Memphis, Tenn., that is using proprietary technology to remove the laser print from the paper. Plans reportedly call for K-C to also install the technology in an affiliate's plant in Rep. Korea. Although other mills are already using 100% laser-printed CPO, K-C's method is said to remove all traces of the ink so it can use the paperstock to make high-quality consumer tissue products.

The seasonal slowdown that occurred late last year in the brown grades—old corrugated containers (OCC), new double-lined kraft corrugated clippings, and bag waste—should be alleviated in the first half as generation of these grades falls. Last year, linerboard mills ran full out. Since little new capacity is coming onstream in 1989, these mills should continue to demand the lower grades, barring a major recession.

Supply of old newspapers (ONP) will continue to exceed demand as more states and municipalities enact mandatory source separation laws. New Jersey was the first state to require its residents to separate ONP from the rest of their trash. This led to a decline in the quality of ONP. If mills want to take advantage of the abundant supplies of ONP that mandatory collection programs generate, they will have to install better cleaning equipment. This would be a better investment in promoting recycling than buying more trash trucks or recycling bins. Substantial new newsprint capacity will come onstream in the next two years, providing some outlet for the ONP, but ONP prices will not recover. In fact, municipalities may have to pay brokers to take the ONP supplies away as landfill space becomes scarce.

Since paperstock is one of the biggest U.S. exports, the economies of Far Eastern countries (the biggest buyers) play a large role in domestic wastepaper supplies. Toward the end of last year, the yen became so expensive relative to the dollar that U.S. citizens were discouraged from buying a lot of goods from Japan. This reduced Japan's need for OCC, which it turns into boxes to ship goods back to the U.S. The exchange rates also led to a prolonged shortage of containers in the U.S. since most of them were sitting in the Far East.

CANADIAN INDUSTRY

GLOBAL-SCALE COMPETITION CAUSING MILLS TO FOCUS ON COSTS, CURRENCIES

Pulp and paper companies in Canada have come through a year of ups and downs that forced many more to realize and respond to a new competitive equation. The focus now is on a global marketplace—encompassing such factors as currency exchange rates, trade policies, and world pulpwood supplies. At the same time, the industry is working at home to cut costs, upgrade facilities, and improve quality and customer service.

Canadian forest products industry earnings were expected to rise about 20% in 1988 from the year before and could match that performance again in 1989, according to some industry prognosticators. Other observers, though, think the industry's earnings may have peaked in 1988 and will be flat this year. But as 1989 ends, most forecasters are less optimistic on the economy. Many are projecting a slowdown or a recession in first-half 1990.

Through 1989, many expect the industry will experience a gradual slowdown overall. Sectors such as newsprint and lumber may deteriorate more rapidly, while market pulp and coated papers will remain buoyant. Linerboard and uncoated groundwood markets are expected to remain relatively flat.

Newsprint markets will be eroded by a substantial

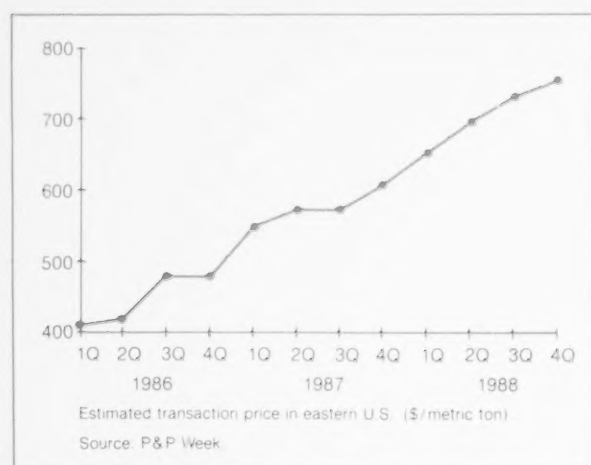
rise in capacity beginning in the second half, while a sluggish construction market and higher costs are expected to pull down lumber margins. Market pulp and coated paper capacity will be relatively flat and demand generally good; however, even these markets are expected to begin to ease by early 1990.

The Canadian Pulp & Paper Assn. projected industry shipments would rise by about 3% in 1988 to 25 million metric tons and could reach 35 million tons—28 million tons exported—by 2000.

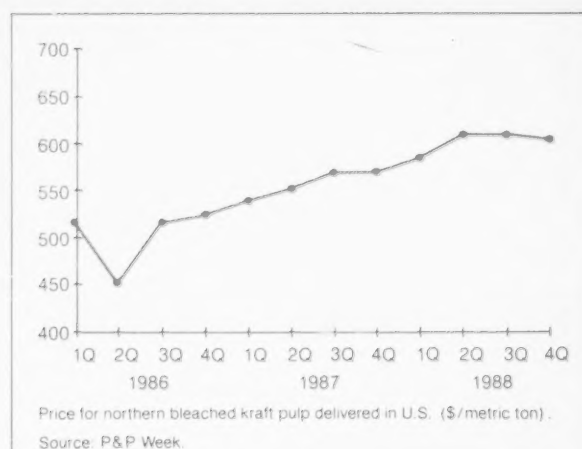
CURRENCY RATES TO STABILIZE. Canadian exports in 1989 should continue to benefit from stable Canadian currency exchange rates affecting overseas markets. The U.S. dollar should also level off in relation to the Deutschmark and yen, adding more impetus to Canadian commodities traded in the U.S. currency. Canadian mills will not see much relief from the effects of the exchange rate with the U.S., however.

In 1988, Canadian companies suffered from a rising dollar that reduced gains on sales made in the U.S. A newsprint price hike in first-quarter 1988 was practically obliterated simply due to the rising Canadian currency. "Unless the Canadian dollar reverses itself substantially, Canada's newsprint mills could thus find them-

Market pulp prices are peaking....



...while newsprint prices are faltering.



selves rather hard-pressed by the competition during the weak period for newsprint we expect in 1989-91," noted Ross Hay-Roe in the August 1988 issue of *Paper-Tree Letter*.

Many analysts forecast the Canadian dollar will be worth US\$0.80 to \$0.82 in 1989. The Conference Board of Canada expects it to maintain this level through 1990. Jay Woodworth, vice president and chief domestic economist for Bankers Trust Co. of New York, projected a rise to US\$0.90 by the end of 1989. In a quarterly survey conducted by the Conference Board of Canada, economists predicted that real gross domestic product would increase an average of 3.8% in 1988 and 2.1% in 1989, while inflation is expected to remain around 4.1% in 1988 and average 4.7% in 1989.

FREE TRADE AGREEMENT. If the pending free trade agreement with the U.S. is not ratified, inflation and interest rates would be higher than expected but the value of the Canadian dollar and growth would be lower, according to forecasters. Some expect a drop in the Canadian dollar to as low as US\$0.75.

Canadian industry earnings would rise if the Canadian dollar dropped because of higher returns on sales in the U.S. However, this would subsequently lead to negative effects in stock market prices, foreign investment, and interest rates, some analysts indicated. But with the Canadian voters returning the Progressive Conservative Party to power in Canada last November, passage of the bill in early 1989 appeared inevitable.

Sorting out the pros and cons, the Canadian industry has come to generally support passage of the free trade agreement, which is expected to open up new markets by eliminating remaining pulp and paper industry tariffs over the next ten years. (Over 90% of Canada-U.S. pulp and paper trade is duty-free already. Tariff protection exists only for such grades as boxboard, containerboard, sanitary papers, fine papers, and some specialty papers. The Canadian tariffs range from 2.5% to 9.2%, while U.S. tariffs run from 1.6% to 4%.)

Gilles Rheume, director of forecasting and analysis for the Conference Board of Canada, expects business will require an adjustment period of five years—including additional capital investment—if the free trade agreement is enacted.

RECORD CAPITAL SPENDING. Canadian companies have already begun to respond to the need to upgrade with 1989 capital spending plans breaking records for the second year in a row. Statistics Canada indicated late in 1988 that Canadian paper companies intended to spend C\$3.77 billion in 1988 for new plants and equipment, up 53.8% from the year before. Quebec was the province with by far the highest capital spending bill—an estimated \$1.09 billion in 1988. British Columbia, though, showed the greatest rise in spending, up 90.7% to \$919.3 million.

Judging by the number of capital projects currently planned, spending will continue strong beyond 1988. An estimated \$6.5 billion in approved projects were in the pipeline late in 1988 for completion during the next two years. Of \$9.07 billion in projects planned for the 1988-92 period, 38% are scheduled for completion in 1989 and 35% in 1990. Clearly, companies plan to keep spending high over the next few years.

This will not only allow producers to offer products that are more competitive in a world marketplace in terms of quality but also enable mills to operate more efficiently. Manufacturing costs per unit should drop, and better technology will lead to better use of the dwindling fiber base. Quality will be better from new and upgraded machines, which will lead to the conversion, upgrading, or shutting down of units that are older and less efficient.

Forest products companies have been negotiating more modest labor agreements in recent years to substantially improve operating costs as well as efficiencies, although the contract ratified in British Columbia last summer was considered to be more expensive than many industry observers felt was justified. The industry's historical penchant for labor disruptions should not pose a problem in 1989, though. Bargaining agreements covering most mills in the East and West are not due to expire until 1990 and 1991, respectively.

CAPACITY RISING. Total paper and board capacity in Canada will increase by 2.5 million metric tons and market pulp capacity will rise by 1.135 million tons, each showing a 14.6% growth over the period 1987-90, according to the most recent Canadian Pulp & Paper Assn. annual capacity survey. During the three-year period, capacity additions in newsprint amounting to 3.2% annually were expected to lead to oversupply as early as second-half 1989.

Total pulp capacity will grow 9.8%, or 2.4 million tons, during this time. Market pulp capacity alone will rise by 2.9% annually over the same period—more than twice the rate attained over the 1977-87 period, but this may not glut markets, except possibly the chemi-thermomechanical pulp (CTMP) sector.

Jaak Puusepp of Pemberton Houston Willoughby Bell Gouinlock Inc., Vancouver, B.C., feels CTMP producers' hopes may be riding on a projected fiber supply shortfall. Some industry analysts say that pulpwood supplies—especially in Canada and particularly for such grades as kraft—are dwindling faster than many realize. "Given this [fiber constraint], all incremental fiber will be developed along the highest-yielding processes [mechanical, thermomechanical, and CTMP], rather than the chemical processes," he noted.

Richard Kelertas, forest products analyst with Scotia McLeod, Toronto, Ont., foresees a shortage of chemical pulp as early as 1995 and expects the Canadian industry to make fiber-related issues a priority. "The industry

will be making some key decisions on fiber development now that the federal and provincial governments are spending less and less on the forest products industry and extracting more money in terms of stumpage. There will be major decisions on forest management expenditures also," he noted.

MARKETING EFFORTS STRESSED. Other issues facing the Canadian industry in 1989 will be higher spending on R&D, better training for workers, more computer process control, and a substantial revamp of sales and marketing, according to Kelertas. "They're being forced to [make improvements]," said Kelertas. "It's a global industry now and it's being currency driven, and there's no excuses if we have a free trade agreement. Everyone is going to have to be as competitive as possible. The buzzword will be service, service, and more service."

The Canadian industry is also concerned with increasing competition in overseas markets. Beginning in 1992, the 12 member countries of the European Economic Community plan to eliminate the tariff barriers among themselves. Outside countries, particularly in Scandinavia, are already seeking closer ties in Europe. Some Canadian companies, such as Cascades Inc. and Consolidated-Bathurst Inc., are investing more heavily there.

Other Canadian producers, including as Abitibi-Price Inc., Noranda Forest Inc., and Canadian Pacific are also diversifying more into other regions, such as Venezuela, Tasmania, and the U.S. Resources are being pooled among mills, outside investors, and even customers—both domestic and foreign—to improve competitive strength in global markets.

Meanwhile, the industry at home continues to restructure through mergers and acquisitions while spinning off less-profitable assets, and foreign investment has been on the upswing. These trends should continue as producers attempt to position themselves in a changing and increasingly competitive world marketplace.

"It's been a year of contrasts—ups and downs—and, surprisingly, the industry has come through in a very resilient manner," noted Kelertas. "I think the Canadian industry can compete and will compete—even with an 83¢ dollar," he added.

NEWSPRINT

CYCLE CHANGES AGAIN AS DEMAND DROPS

■ The newsprint industry boom drew to a close along with the end of 1988, and this downward trend is expected to continue during 1989. The upturn that began late in 1986 with rising industry earnings, improved demand, and higher prices began to reverse itself in second-half 1988. Substantial capacity additions and relatively flat consumption this year appear likely to de-

press the market by year-end and continue through 1990.

North American newsprint capacity is expected to rise by 1.759 million metric tpy, or 11.4%, during 1987-90, according to a recent Canadian Pulp & Paper Assn. annual capacity survey. "Newsprint capacity will show a higher rate of increase in the period under review than we have witnessed for several decades," CPPA noted.

Trouble with the market began last spring as the output from mills running close to capacity since early 1987 began to result in rising inventories. At the same time, publishers were starting to see the results of their efforts to conserve newsprint, and their own newsprint stocks were growing. The resulting ease in demand in the U.S. began to create spot markets, with mills offering distressed prices for tonnage they were unable to sell to contract customers.

After three newsprint price increases since first-quarter 1987 resulting in about a 22% rise in transaction levels (U.S. East), publishers began to fight back. Newsprint costs were rising faster than ad revenues at a time when newspaper industry profits overall were dropping, primarily due to competition from other advertising media.

Newspapers in major cities suffered substantial losses in circulation. Late in 1988, the Audit Bureau of Circulation indicated that during the six-month period ending Sept. 30, 1988, 12 of the top 25 daily newspapers and 11 of the top 25 Sunday papers in the U.S. posted losses in circulation.

National ad space in newspapers is expected to decrease 2% in 1989, according to a recent forecast from Branham Newspaper Sales. The slippage is part of the trend to mergers and acquisitions in the retail industry, a reduction in financial ads due to the October 1987 stock market plunge, and reduced earnings in major industries such as tobacco, it was noted.

NEWSPRINT CONSERVATION TREND. Publishers will be lean on newsprint consumption this year—with a growth of less than 2% projected by most analysts—for reasons other than ad projections. They have found ways to cut newsprint usage to lower operating costs. Many have simply reduced their waste by such methods as better control on the presses. Basis weight was decreased by major customers, such as Dow Jones. Marginal circulation and special editions were eliminated. News holes—the ratio of editorial content to ad space—were trimmed. And some even narrowed the width of their pages.

By mid-1988, the results became apparent. Consumption had begun a downward trend in April that continued for at least six months. According to American Newspaper Publishers Assn. figures, U.S. daily newspaper consumption of newsprint dropped 3.2% in September, the sixth consecutive decline compared with year-earlier totals. This brought total consumption through the first three quarters down 0.4%.

At the same time, a panic associated with projected North American capacity increases during 1989-92 was causing newsprint producers to negotiate long-term supply agreements with substantial discounts. As the year progressed, prices continued to erode. By year-end, even the buyer of as little as 1,000 metric tpy was getting a 2% discount in the East. The West, though, maintained discount levels of 7% to 8% (including a 5% full-contract-amount discount) for volume buyers of 10,000/20,000 tons or more (varying mill to mill). In the East, 40,000-tpy contracts could draw 12% discounts, and the biggest discounts were said to be as high as 20% for the highest volume purchasers. Spot market discounts, meanwhile, were as high as 24%.

PRICE HIKE PROSPECTS UNCERTAIN. Despite these apparent signs of eroding markets, the industry announced a \$45/metric-ton price increase for Jan. 1, led by the Canadian mills wanting to recoup losses from a higher Canadian currency. Practically all of the Jan. 1, 1988 price increase was eroded for Canadian producers by the Canadian dollar rising to US\$0.82 during the year.

Toward year-end, though, the industry began to reduce the amount of the hike to about \$30/metric ton and rollback to Feb. 1 in the East and Apr. 1 in the West. This would bring list prices to \$630 in the West and \$680 in the East. But even if some mills stick to Jan. 1 or Feb. 1, prices will probably be delayed for some customers until Apr. 1 or later. Some industry analysts don't expect the price increase to hold at all; others believe that if it is successful on the books, the discounts will more than offset any net gain in actual transaction levels.

For much of the year, transaction levels remained at about \$610 in the East and \$600 in the West, after taking into account an average weighted discount of about 6.5% in the East and the full-contract-amount discount of 5% in the West. But by early in the fourth quarter, the eastern price was eroding. Discounts were rising 2% to 3% or more, reducing the market price to about \$600 by year-end. In the West, discounting was not as severe, but market prices were slipping to about \$590 by year-end.

BUYERS GAIN MORE BARGAINING CLOUT. Part of the problem with raising newsprint prices has been an increasing concentration of the customer base that allows "most of the larger chains... to use their clout in the marketplace to maximize their operating profits," noted Jim Rowland, editor of the *Canadian Paper Analyst*, Toronto, Ont.

With the U.S. market apparently headed for a glut period over much of the next two to three years, producers will be looking to market their output in other areas. However, significant capacity additions planned in regions such as Europe and Japan seem to be gearing to-

ward making those regions self-sufficient or in a surplus position. European newsprint capacity will increase 11% between 1988 and 1992, with another 18% proposed but not finalized. At the same time, consumption is expected to grow just 9.2%, according to European Paper Institute figures.

Roger N. Wiewel, senior vice president of MacMillan Bloedel Ltd., indicated that the projected world expansion of newsprint would add about 18% to world capacity at a time when demand appears to be slowing due primarily to the sluggish growth in the insert market. He believes North America will experience overcapacity, with Canadian operating rates dropping to below 90% during 1990-92.

Abitibi-Price Inc. indicated at an analysts' meeting in late November that it expected U.S. and Canadian newsprint industry operating rates to drop to about 94% this year, compared with 98% to 99% in 1988. Operating rates in both countries were expected to continue to decline to about 92% in 1990 and about 90% in 1991 and 1992.

UNCOATED GROUNDWOOD

A MODERATELY GOOD YEAR

■ North American demand and prices for uncoated groundwood papers climbed upward in 1988 even as some new and converted paper machines came online or reached design capacity. The full effect of this new tonnage will be felt this year and next. This is particularly true of paper closely related to newsprint, which is already abundant. Groundwood paper markets may therefore undergo a leveling off in both price and demand, industry sources say.

In fact, slow economic growth in the U.S. will mean lower operating rates and possibly some price discounting, according to Brian Topp, an analyst with Capital Group Securities, Toronto, Ont. The slowing growth was apparent by the end of 1988, and North American mills will have a difficult time this year achieving price increases, Topp said.

Production and shipments of groundwood specialty grades at Canadian mills continued their strong advances for the first three quarters of 1988, the Canadian Pulp & Paper Assn. reported. Production for the first nine months was 13.8% above year-ago figures, while overall shipments rose 12.7% for the same period, CPPA said.

The strength of the U.S. markets helped increase January-to-September exports to the U.S. by 12.9% (to 882,000 metric tons), while domestic shipments (172,000 metric tons) were up 14.7%. Other exports advanced 7.4%. Despite a jump in mill inventories, most machines are running full out, or close to it, and are shipping most of that tonnage.

U.S. mills also reported continuing increased shipments, about 4.8% for the first nine months of the year compared with 1987, the American Paper Institute said. API figures put new orders growth at 1.8% and mill inventories negligibly higher.

Capacity expansion continues in both Canada and the U.S. CPPA estimates that groundwood printing and specialty paper capacity will rise 8.6% this year after a 11.0% jump in 1988 from 1987. Such an increase would put Canadian capacity at 1.64 million tons in 1989. Groundwood paper capacity is expected to advance another 11% in 1990 to 1.82 million tons.

Major expansion projects include a new supercalendered (SC) paper machine started up in fall 1988 by St. Marys Paper Inc., Sault Ste. Marie, Ont., which will add 125,000 tpy of capacity after shutdown of an existing machine. St-Raymond Paper Ltd. is reactivating the idle 70,000-tpy Pejepscot mill in Maine. This year, Consolidated-Bathurst Inc. will start up a new 183,000-metric-tpy machine at Grand'Mère, Que., which will produce a range of high-quality newsprint and groundwood paper grades. The project will add about 112,000 tpy net after shutdown of two older machines. In the U.S., Daishowa America is studying a possible new 150,000-tpy directory paper machine at Port Angeles, Wash., and Lake Superior Paper Industries, partially owned by Pentair Inc., is contemplating a second high-filled SC machine similar in size to the 240,000-tpy machine that started up in late 1987.

WILL CAPACITY OUTPACE DEMAND? Fairly stable growth rates of 5%/year are expected for the next several years in major end-use markets for uncoated groundwood. Mild or even negative economic growth and high availability of newsprint may affect some sales of uncoated groundwood grades. One estimate indicated demand increasing 500,000 short tons by 1990, but capacity growth will be 934,000 short tons.

Within the individual markets, SC paper shows the brightest promise. Additional capacity and higher-quality paper, especially on the top end, could help SC grab some market share from coated groundwood grades, should prices continue upward or should printers and end users look for cost-cutting measures during an economic downturn. In fact, SC papers may account for about 16% of the catalog paper market by 1995, up from 4% in 1986. Some of that growth will come at the expense of the machine-finished grades as well as from the general growth in catalogs.

Directory paper producers may be able to take some advantage of continuing growth

in telephone directories and lightweight catalogs. The number of titles and the distribution of telephone directories are forecast to increase 32% and 9.4%, respectively, from 1987 to 1993, according to a study prepared for Graphic Arts Marketing Information Service (GAMIS). The report, prepared late last year by D. Gentile Associates, Centerport, N.Y., said that, the total number of pages per directory will be 9% to 10% higher. Most paper used will continue to be uncoated groundwood.

The GAMIS study also indicated that the use of yellow directory paper will grow. In 1987, Yellow Pages directories accounted for 52% of total directory pages. That figure will rise to 62% by 1993, the report said. At the same time, white pages will decline from 43% in 1987 to 33% in 1993.

Office electronics are creating new opportunities for groundwood producers who manufacture basestocks for computer forms. The number of small, inexpensive computer printers is expected to grow rapidly.

STRONG GROWTH FOR INSERTS. The major commercial printing side—preprinted inserts and flyers—is expected to continue high growth rates of at least 5% annually, and more likely 6.5% or even higher, through 1992, most industry sources say. "It's one of the fastest growing areas of printing," said Jim Workman, assistant manager of techno-economic forecasting at the Graphic Arts Technical Foundation (GATF). Workman said that in 1986, paper for inserts was worth \$2 billion and should be worth \$2.6 billion by 1989. "We're anticipating about a 5% to 6% increase for '89," said Gene Dunsirn, director of purchasing at Quad Marketing. As a result, one industry estimate puts growth for paper consumption used for coupons at over 7.5% from 1988 to 1989 and for catalogs at a whopping 23%.

Paper consumption for inserts and flyers, excluding coupons and catalogs, should rise 7.2% to almost 2.5 million tons in 1989 from 1988, according to Eric Edelmann, vice president, Walker Wiener Associates Inc. (WWA), a market research firm. GATF put total 1986 paper consumption at roughly 3 million tons, and another industry source estimated 1989 paper consumption at over 3.5 million tons for this category.

TABLE 4: New North American uncoated groundwood capacity.

Company	Mill	Tons	Grade	Startup
Madison	Madison, Maine	20,000	SC-A	1988
St-Raymond	Pejepscot, Maine	70,000	Specialties	1988
St. Marys Paper	Sault Ste. Marie, Ont.	130,000	SC-A/B	1988
Soucy	Rivière-du-Loup, Que.	20,000		1988
St-Raymond	St-Raymond, Que.		Directory	1988
Abitibi-Price	Alma, Que.	60,000	Directory	1989
Con-Bathurst	Trois Rivières, Que.	30,000	SC	1989
Kruger	Trois Rivières, Que.	33,000	SC	1989
Con-Bathurst ¹	Grand'Mère, Que.	125,000	Specialties	1990
Kruger	Corner Brook, Nfld.	77,000	SC-B/C	1990
Daishowa ²	Port Angeles, Wash.	120,000	Directory	n.a.
Lake Superior ²	W. Duluth, Minn.	240,000	SC-A	n.a.
Cascades ²	Port Cartier, Que.	231,000	SC-A/B	n.a.

1. Includes high-quality newsprint grades.

2. Proposed or under study.

Edelmann said the second largest chunk, after newsprint, was SC paper, which represents about 22.9% of 1988 tonnage. This is followed by coated groundwood at 16.7%, coated free-sheet at 12.6%, uncoated groundwood other than SC at 11.8%, and uncoated free-sheet at less than 0.3%, according to Edelmann. GATF's Workman had similar figures for coated groundwood, SC, and coated free-sheet but much higher figures for uncoated free-sheet and machine-finished groundwood grades.

WWA forecasts the strongest growth for SC paper, which accounts for about 524,800 tons of insert/flyer paper in 1988. Consumption of SC for this use is expected to jump 11.7% in 1989 from this year, compared with 9.2% for coated free-sheet, 8.8% for coated groundwood, 6.9% for uncoated free-sheet, 4.1% for other uncoated groundwood grades, and just 2.6% for newsprint.

Prices on all grades rose substantially in 1988, but most observers expect only a single price hike in 1989. Prices could be subject to discounting as the economy turns down or as more newsprint becomes available.

MARKET PULP

LOOKING FOR THE NEXT DOWNTURN

■ Pulp prices have been on an incredible roll—nearly doubling over the last three years. But instead of enjoying their newfound prosperity, industry executives and analysts are beginning to worry about when the next market down cycle will begin.

The price of market pulp has risen almost every quarter for three years, and producers recently announced another price increase for first-quarter 1989. The latest increase would be \$40/metric ton in the domestic market and \$50 in Europe and Japan. This would take the price of benchmark northern bleached softwood kraft (NBSK) pulp to \$800/ton in the U.S. and to \$810 in export markets. Since the end of 1985, the price of NBSK will have roughly doubled from the lows reached in the last market downturn.

The main factors that are driving the dramatic rise in pulp prices have been tight supply and the falling value of the U.S. dollar. Although the pulp market may have eased a bit since last summer, North American and Nordic producer inventories of chemical paper-grade market pulp at the end of November still were at only 836,000 metric tons. Meanwhile, Canadian and U.S. market pulp mills continue to struggle to keep up with demand, running at close to 100% of capacity.

The decline of the dollar since last fall set the stage for the latest pulp price increase. As occurred in many previous quarters over the past three years, the drop in the dollar opened a large gap with local currency prices. And with pulp still in tight supply, North American producers raised prices to close the gap. Even with the latest increase, the new \$810 price of North American pro-

ducers in Europe in early December was still about \$15/ton below prevailing local currency prices of Nordic producers in Europe.

PRICE FREEFALL? Most industry analysts believe the pulp market is near its peak, although another price increase in 1989 is possible if the U.S. dollar continues to decline. For example, Rodney Young of Resource Information Systems Inc. expects world demand for chemical paper-grade market pulp to slow in 1989 as an economic recession hits in the second half of the year.

He expects a 2% increase in world pulp demand this year, resulting in an average operating rate for the year of 96%. This compares with a 4% increase in demand in 1988, with utilization rates close to a record 97% to 98%. Young believes chemical paper-grade pulp prices will begin to show weakness in third-quarter 1989, led by hardwood grades.

The weakness then may spread to NBSK in the fourth quarter, with pulp prices going into a free-fall in 1990. By early 1991, Young expects the price of NBSK to have dropped about \$200/metric ton from its expected peak in first-quarter 1989. This will still leave North American pulp producers "in pretty good shape" as far as profitability is concerned, but Nordic producers would be at or slightly below the break-even level, according to Young.

Another analyst who believes market pulp prices could possibly begin to weaken late next year is Ross Hay-Roe, editor of *PaperTree Letter*. He notes that inventories of purchased pulp at U.S. paper mills have begun to rise (reaching 628,000 short tons in September 1988, up about 100,000 tons since last spring). "Such inventory changes may be an early indication that the turning point in this excruciatingly tight pulp market is not far off," notes Hay-Roe. "But there's a long lag between a rise in customer inventories and any weakness in prices." By late 1989, however, "we might see prices begin their normal downward slide, with hardwoods leading the way."

The doubling of pulp prices over the past three years has not had much impact on buyers in Europe and Japan in their own currencies due to the declining dollar. But North American pulp buyers have had to absorb the full impact of the \$400/ton rise in pulp over three years, and they can be expected to try to leverage prices down. This is true of buyers in many Third World countries whose currencies tend to move with the U.S. dollar.

CTMP WILD CARD. One factor that may cause difficulties for the market this year is about 750,000 tpy of new bleached chemi-thermomechanical pulp (CTMP) capacity starting up in Canada over the 1987-89 period. This would include production from four new mills (Cascades Inc., Millar Western Pulp Ltd., and Fibreco) plus two mills that have recently been expanded or upgraded (Consolidated-Bathurst Inc. and Quesnel River

Pulp Ltd.). Since markets for this new grade are not well established, producers may have to offer competitive prices to interest buyers in trying this new pulp.

While not much new chemical market pulp capacity will be starting up this year, substantial production will be coming onstream during the early 1990s. According to a recent tabulation in *PaperTree Letter*, only about 1.2 million tons of new chemical paper-grade pulp capacity will be coming onstream worldwide during the 1988-89 period. But in 1990-91, about 3.37 million tons will be

added, followed by another 3.2 million tons in 1992-95. Most of the new capacity, about 80%, will be hardwood pulp, Hay-Roe estimates.

If there is no recession in 1989, the pulp market could remain strong for at least another year or longer, Young notes. But this would probably encourage even more expansion activity that would come back to haunt producers in the early 1990s. One law of physics that seems to apply to the unpredictable pulp market: what goes up must (eventually) come down.

LABOR

RELATIONS ARE STRAINED

Last October, the United Paperworkers International Union unconditionally ended its 16-month strike against three of International Paper Co.'s mills. The end of the strike highlighted some truths about labor-management relations:

- Companies will run their mills with salaried people or replacement workers in the event of a strike.
- Premium pay for Sunday and holiday work is becoming a thing of the past.
- The pooled voting strategy attempted by several UPIU locals working for IP wasn't successful.

UPIU ideally would like to negotiate on a national level with IP and other paper companies. This would give it more clout, similar to what union members in Canada enjoy when they negotiate new contracts. It would require that contracts at a company's mills lapse at the same time, however, and companies are not likely to acquiesce.

In November, all locals employed by IP, regardless of what union they belonged to or their current bargaining status, were invited by UPIU to join a pool to coordinate their bargaining. The international of UPIU will supervise the bargaining to seek four goals for all IP mills: ensure rehiring of all ex-strikers, prevent subcontracting of existing permanent jobs, maintain current premium pay for Sundays and holidays, and maintain current length of contract. UPIU locals that worked for IP and Georgia-Pacific Corp. attempted this in 1987, but they were not successful.

Pooled voting may also be used this year by locals negotiating with Champion International Corp., Boise Cascade Corp., Temple-Inland, and Packaging Corp. of America. Locals were voting on this late last year. Each local would retain its decision-making power, but key issues decided on at the outset would be dealt with in a coordinated way. Premium pay continues to be one of the union's big concerns at all of these companies, as does preventing total work rule flexibility.

BUSY YEAR FOR LABOR. This year, 120 U.S. mills will be negotiating new contracts, compared with 84 in 1988. Labor consultant Julian M. Kien noted that labor's agenda in 1989 includes support for child-care provisions, parental leave, retiree benefits, and possible further tightening of the plant closure notification bill (see p. 200). Labor will also be part of the coalition pushing for mandatory health insurance. It will work to pass a bill that was presented last year by Rep. Joseph Brennan, D-Maine, that calls for a 70-day waiting period before a company can hire permanent replacements for strikers. As of November, the bill had 14 cosponsors. A new bill that would strengthen OSHA's health and safety rules for the workplace is also expected to be a major issue.

The industry will pursue its cost-cutting agenda and negotiate an end to premium pay for Sundays and holidays in more contracts. As of late 1988, about 70 mills in the U.S. had eliminated Sunday premium pay. More mills are seeking to implement flexible work rules as well. Companies are making an effort to keep their employees informed about the competitive situation of their mills. A good example of this occurred last fall, when Kimberly-Clark Corp. informed mill employees at Coosa Pines, Ala., that the mill was a high-cost producer and modernization was needed to maintain it as a viable enterprise. Union members agreed to accept work rule changes, and K-C agreed to spend \$200 million to modernize the mill.

The average first-year wage increase in 1988 was 0.7%, compared with 0.4% in 1987, according to American Paper Institute statistics. The average second-year increase was 2.0%, inching up slightly to 2.1% in the third year. This compares with 1.5% and 1.6%, respectively, in 1987 contracts. First-year increases will continue to be curtailed in 1989 bargaining, as companies' practice of giving lump-sum payments in lieu of a first-year increase is now a permanent fixture of bargaining.

vide specific limits on dioxin. Data from the 104-mill study will be provided to states to help them formulate requirements. It is unlikely that all mills will be facing limits on dioxin discharges this year unless EPA becomes more involved in setting limits. The Office of Technology Assessment will issue a report early this year on dioxin and chlorine use in the pulp and paper industry that may cause Congress to call for specific regulations.

Last November, API said it had identified ways to eliminate concerns related to dioxin in the manufacture of bleached paper products. It said a range of options can be implemented by mills, including strictly controlling the amount of elemental chlorine used, substituting other bleaching agents for chlorine, and installing or modifying prebleaching processes, such as using extended or oxygen delignification. API estimates that it will cost mills about \$1 billion total to implement these changes over a two- to three-year period.

CANADIAN TESTING BEGINS. This year, tests will begin on the effluent, sludge, and pulp at Canada's 47 bleached pulp mills. Until this data is gathered and analyzed, limits on dioxin in mill effluent will probably not be promulgated. The Pulp & Paper Research Institute of Canada conducted a study last year that it said shows certain types of oil-based defoamers used in the brown-stock washing stage cause the formation of precursor compounds that in turn form dioxin when chlorine is added.

In addition to using the right kind of defoamer, the 47 bleached pulp mills will spend approximately C\$10 million each over the next two years in order to alter their facilities. Most of the money will probably go toward chlorine dioxide generators. Early this year, the National Dairy Council of Canada will launch a nationwide test for dioxin in milk that is packaged in solid bleached sulfate board, the majority of which is imported from the U.S.

PULPWOOD

CHIP PRICES ON THE RISE

Housing starts in the U.S. through the first ten months of 1988 were running at an annual rate of 1.55 million units, compared with about 1.62 million starts in 1987. Housing starts for all of 1988 were forecast to be about 1.48 million units. Starts in 1989 are forecast to be about 1.3 million units, which will reduce woodchip supplies since less timber will be milled.

The drought and the woodworkers strike in the Pacific Northwest conspired to curtail logging in that region last summer and has left many people praying for a good winter so inventories can be rebuilt. Woodchip supplies at pulp mills continue to be ample, but the price of Douglas fir chips has risen to around \$63/bdu delivered to pulp mill. The export price of Douglas fir chips to Japan for the first half of this year is forecast to increase again—it rose \$7.50/bdu last July to \$86.70/bdu f.o.b.

Sawmills in the Northwest are having to pay more for their timber because of offshore demand from Japan, Rep. Korea, and People's Rep. China. Public timber supplies are dwindling as the U.S. Forest Service lowers the amount of allowable cut. Legal action taken by environmental groups has also held up logging in the Northwest. These factors are driving up the price of timber in the region and could cause some sawmills to shut down, reducing the chip supply. WTD Industries Inc. is planning to build a pulp mill in Oregon, and Pope & Talbot Inc. is planning a major addition to its pulp mill in Halsey, Ore., so chip supplies in that region are forecast to become tighter.

The timber supply in the South is shifting from softwood to hardwood. The price of hardwood chips in the region has gone up about 17% (Table 5). Hardwood chips are much in demand in the Far East. They are being sold to Japan and Taiwan via the ports of Lake Charles, La.; Mobile, Ala.; Savannah, Ga.; and Moorehead, N.C. Even adding ocean freight, woodchips exported from the southern U.S. and Chile are cheaper than domestic chips in Japan. Pulp mills in the South will also be competing with reconstituted panel producers for chips and possibly roundwood.

TABLE 5: Slower housing starts increased woodfiber costs in '88.

	1Q	2Q	3Q	% change 3Q '88/ 3Q '87
West Coast U.S.				
Douglas fir chips (f.o.b. export prices to Japan)	\$79.20	\$79.20	\$86.70	13.5%
Roundwood, pine ¹	42.84	42.94	43.00	n.a.
Roundwood, hardwood ¹	36.03	35.40	37.12	n.a.
Greenchips, pine, clean ¹	20.84	20.34	20.56	9.6
Greenchips, hardwood, clean ¹	16.98	17.01	18.50	17.4

1. Source: Timber Mart-South. Roundwood prices are f.o.b. yard, no freight, no yard cost. Chip prices are f.o.b. sawmill.
n.a. = not available.

ISSUE FOCUS: CAPITAL SPENDING

CAPITAL SPENDING SURVEY: 1988-90

Capacity expansion is the focus of record spending plans in both the U.S. and Canada, with major programs stretching well into the 1990s

By **CARL ESPE**, News Editor

Capital spending is booming in the North American pulp and paper industry, according to *Pulp & Paper's* annual survey of investment plans. Strong demand and record prices for most grades have led to record profits at U.S. and Canadian paper companies, providing the funds for ambitious modernization and expansion programs. If paper companies fear a recession around the corner—as do many economists—they are not showing it in their capital spending budgets. Last year, paper companies largely ignored the stock market crash when formulating their spending programs. This year, there appears to be a similar lack of concern about prospects for a downturn in the economy.

Capacity expansion is the driving force behind the spending boom. Newsprint leads the way in both the U.S. and Canada, but other grades are heating up. In the U.S., high prices and tight markets have led to renewed expansion activity in the containerboard sector and in kraft market pulp, both of which saw below-average growth for most of the 1980s. In Canada, strong growth continues in market mechanical pulp and white paper, and growth is accelerating in kraft market pulp as well.

Overseas investors attracted by weak domestic currencies are an important factor in current expansion plans. Pacific Rim companies from Japan, Rep. Korea, New Zealand, and Australia have committed hundreds of millions of dollars to expansion projects under way in the U.S. and Canada. This trend—relatively rare in the U.S. up till now—could become increasingly common if the dollar remains weak. The Japanese, in particular, have tremendous buying power in North America.

Environmental compliance spending is another area that is heating up as states and provinces formulate new regulations in such areas as odor control and discharge standards. The major problem of dioxin in kraft pulp mill effluent—still being studied by government agencies—will cost the industry over a billion dollars in the U.S. and almost half a billion in Canada, according to American Paper Institute and Canadian Pulp & Paper Association estimates.

P&P's latest investment survey, conducted in November, primarily covers spending plans for the three-year period from 1988 through 1990, along with a few longer-

range projects. U.S. companies report plans to spend \$13.69 billion on capital projects at pulp and paper mills during the survey period, an increase of 70% over spending plans reported in last year's survey for 1987-89. Planned 1988-90 outlays in Canada total C\$9.92 billion, up 49% from last year. Projects scheduled for completion in 1991 and 1992 account for 18% of total spending in the U.S. and 12% in Canada.

Forecast sounds a cautious note. A recent Data Resources Inc. study found that U.S. pulp and paper companies plan to spend \$11.46 billion on capital projects in 1989, up 4.8% from estimated 1988 spending of \$10.93 billion. While still a new record, that level of spending would signal a marked cooling off from the heated activity of 1988, when spending climbed 21.3%, compared with 1987. In addition, DRI reports that companies plan to trim spending in 1990 to \$10.76 billion, down 6.1% from this year. Conducted from September to November, the DRI study was based on responses covering 9.6% of the industry's spending plans. Results for the paper industry are in line with other manufacturing sectors. Overall, manufacturers plan a 4.7% increase in capital spending this year, DRI reports.

Spending up sharply in Canada. As in the U.S., spending programs in Canada have been lifted by record prices and continuing tight markets for most grades. So far, the rise in the value of the Canadian dollar relative to the U.S. dollar has not visibly affected spending plans in Canada. Interest in new capacity-expanding projects continues to run high, fueled in many cases by foreign companies that are less affected by the ups and downs of the Canadian dollar.

Canadian pulp and paper companies planned to spend a record C\$3.77 billion on new plant and equipment in 1988, according to the latest government survey of spending plans, completed by Statistics Canada in July. That represents a 53.8% increase over 1987, when

Complete results of P&P's exclusive survey of North American capital spending programs for 1988-90 are available in a separate **Mill-by-Mill Listings** report. Organized by company, the listings show programs for new mills and machines, rebuilds and modernizations, environmental quality control, and other mill improvements, with specifics on equipment ordered, dates, suppliers, and prices, where available. Subscribers to P&P's monthly newsletter, *Project Report*, receive a free copy of the report with their January issue. All others may obtain a copy of the report for US\$145. To order, send payment to Pulp & Paper, Editorial Dept., 500 Howard St., San Francisco, Calif. 94105.

CAPITAL SPENDING

companies spent a record \$2.45 billion on capital projects. Except for a 7% dip in 1986, capital outlays have risen every year in Canada since 1983.

New machinery accounted for 84% of planned expenditures in the Statistics Canada survey, totaling \$3.17 billion. Construction costs were pegged at \$598 million, or 16% of overall outlays. These figures are up 48.4% for machinery and 91.0% for construction, compared with 1987.

Spending plans were up 16.8% from late 1987/early 1988, when companies reported plans to spend \$3.23 billion on new plant and equipment in 1988. The lion's share of these revisions is in the construction area, where spending plans jumped 60.1%. Planned outlays for new machinery were revised upward only 11.1%.

ABOUT P&P'S ANNUAL SURVEY. Now in its twenty-fifth year, P&P's annual capital spending survey covers expansion and modernization programs at U.S. and Canadian mills. Unlike surveys that track spending by year, this survey covers spending by project. Dollar figures represent the total cost of reported projects and may sometimes include supporting equipment. The total cost of multiyear projects is assigned to the startup year and is not divided among the years of expenditure. Each survey primarily covers a three-year period—the current survey covers 1988-90—but projects with firm startup dates beyond that time frame are included. ■

UNITED STATES

AMBITIOUS EXPANSION PLANS FUEL RECORD SPENDING INTO THE NEXT DECADE

■ By just about any measure, capital spending is booming in the U.S. pulp and paper industry. U.S. mills report plans to spend \$13.69 billion on modernization and expansion projects over the next several years. That total is up over 70% from this time last year, when mills reported plans to spend \$8.04 billion on capital projects. Companies report another \$1.84 billion worth of proposed projects under active consideration but not yet approved with startup dates (these proposed projects are not included in P&P's spending breakdowns). Broken down by year, spending totals \$2.47 billion for projects completed in 1988, \$3.21 billion for those scheduled for 1989, \$5.00 billion for 1990, and \$2.43 billion for 1991 and 1992.

Record earnings and continued strong demand are the most important factors in the investment upswing. Capital spending is tied strongly to cash flow, and companies expect another good year of high prices and strong demand, which will keep cash flows up and provide funds for higher capital outlays. Capacity expansion is the focus of a growing number of spending pro-

U.S.—REPORTED CAPITAL EXPENDITURES FOR 1988-90+ BY REGION AND TYPE OF FACILITY (\$000)

PRODUCTION-RELATED EXPENDITURES

	WOOD/FIBER		PULPING		NEW MACHINES		REBUILDS		ENERGY		PLANT	
New England	5,000	1%	340,200	7%	250,000	7%	287,900	14%	368,900	27%	68,460	9%
Mid-Atlantic	0	0%	17,250	0%	0	0%	92,406	4%	122,427	9%	2,609	0%
East North Central	0	0%	155,747	3%	872,350	23%	347,031	17%	83,540	6%	169,030	21%
West North Central	50,000	11%	333,315	7%	578,455	16%	26,000	1%	8,976	1%	60,854	8%
South Atlantic	100,675	21%	1,486,640	32%	914,313	25%	604,385	29%	338,170	25%	194,830	25%
East South Central	215,190	45%	1,285,655	28%	455,175	12%	432,500	21%	261,840	19%	199,355	25%
West South Central	44,300	9%	353,500	8%	350,125	9%	204,800	10%	20,900	2%	34,036	4%
Mountain/Pacific	58,140	12%	610,140	13%	298,750	8%	92,814	4%	148,500	11%	64,158	8%
Total	473,305		4,582,447		3,719,166		2,087,636		1,353,253		793,332	

ENVIRONMENTAL QUALITY SPENDING

	WATER		AIR		SOLID WASTE		PRODUCTION		ENVIRONMENT		TOTAL	
New England	0	0%	1,550	1%	9,800	23%	1,320,460	10%	11,350	2%	1,331,810	10%
Mid-Atlantic	2,540	1%	7,500	3%	1,055	2%	234,692	2%	11,095	2%	245,787	2%
East North Central	10,732	3%	11,948	5%	7,870	16%	1,627,698	13%	30,550	4%	1,658,248	12%
West North Central	4,752	1%	10,752	5%	396	1%	1,057,600	8%	15,900	2%	1,073,500	8%
South Atlantic	238,958	57%	24,804	11%	9,446	22%	3,639,013	28%	273,208	40%	3,912,221	29%
East South Central	86,230	21%	86,300	40%	8,600	20%	2,849,715	22%	181,130	27%	3,030,845	22%
West South Central	10,800	3%	16,370	8%	900	2%	1,007,661	8%	28,070	4%	1,035,731	8%
Mountain/Pacific	65,890	16%	58,140	27%	4,770	11%	1,272,502	10%	128,800	19%	1,401,302	10%
Total	419,902		217,364		42,637		13,008,341		680,103		13,689,444	

States are assigned to regions as follows:

New England: Maine, Vt., N.H., Conn., R.I., Mass.

Mid-Atlantic: N.Y., N.J., Pa.

East North Central: Wis., Mich., Ill., Ind., Ohio

West North Central: N.Dak., S.Dak., Nebr., Kans., Minn., Iowa, Mo.

South Atlantic: Del., Md., V.Va., Va., N.C., S.C., Ga., Fla.

East South Central: Ky., Tenn., Miss., Ala.

West South Central: Okla., Texas, Ark., La.

Mountain/Pacific: Wash., Ore., Calif., Alaska, Idaho, Nev., Mont., Wyo., Utah, Ariz., Colo., N.Mex.

grams across virtually the entire spectrum of grades. In addition, high market pulp prices have led to an increase in pulping projects to expand tonnage for both internal use and sale. New state regulations in such areas as odor control and discharge standards will focus attention on environmental spending as well. For example, the state of Georgia has issued air quality standards that could force major air-quality spending programs at kraft pulp mills in the state by the early 1990s. Programs to rid pulp mill effluent of dioxins will also keep environmental spending high.

Production-related spending totals \$13.01 billion in the current survey, up 71% from last year. Broken down by process area in the mill, the largest gains are in pulp mill spending, followed by new paper machine installations and outlays for woodyard improvements. Low energy prices have put power plant improvements on the back burner at many mills, and this is the only area where planned spending is not higher than last year.

Environmental spending is up 51% in the new survey to \$680 million. Last year's survey saw the first increase in environmental spending plans since 1982, and this year's jump confirms the new importance of this area. Environmental outlays will almost certainly grow in coming years as mills formulate programs to eliminate dioxins from pulp mill effluent and to comply with new, more stringent air and water quality standards. In the current survey, environmental spending accounts for 5% of overall expenditures, well below the 1970s' level. Current plans focus on water-quality programs, which are up 105% to a total of \$420 million for the 1988-90 period. Air-quality programs are pegged at \$217 million, up 14% from last year, and solid-waste spending will decline 19% to \$43 million after several years of sharp increases.

Pulp mill upgrades lead the way. Pulp mill spending shows the strongest growth for the second year in a row. Mills report plans to spend \$4.6 billion on pulp mill expansion and modernization projects over the 1988-90 period. The pulp mill accounts for over 35% of total production spending this year, up from 24% last year and only 16% in 1986.

Activity is picking up strongly in the chemical pulping area after a hiatus of several years. High pulp prices and tight markets are an incentive to both producers and consumers, and the current crop of expansion projects is about evenly divided between the two groups. This upswing in expansion plans has been a recent phenomenon, with many of the largest projects gaining approval only within the last few months. Most of the increases will come in 1990 or later.

Expansion projects announced for completion in 1990 by Weyerhaeuser Paper Co. at Columbus, Miss.; Louisiana-Pacific Corp. at Samoa, Calif.; and Bowater Southern Paper Co. at Calhoun, Tenn., will add over 450,000 tpy to bleached kraft market pulp capacity. In 1991, Stone Container Corp.'s Port Wentworth, Ga., mill will

start up a new 740-tpd bleached hardwood kraft market pulp mill as part of a \$335-million modernization, and Union Camp Corp. will complete a 105,000-tpy market pulp facility in its \$675-million expansion program at Eastover, S.C. A four-year, \$408-million modernization at Champion International Corp.'s Courtland, Ala., mill, scheduled for completion in 1993, includes 250,000 tpy of new bleached kraft pulp.

These new projects join previously announced major expansions under way at Georgia-Pacific Corp.'s Port Hudson, La., mill; Nekoosa Papers Inc.'s Ashdown, Ark., facility; Federal Paper Board Co. Inc.'s Riegelwood, N.C., mill; and ITT Rayonier Inc.'s Jesup, Ga., plant. A \$330-million expansion at Pope & Talbot Inc.'s Halsey, Ore., kraft market pulp facility appears likely to proceed for completion in 1991, and WTD Industries Inc. has plans to build a \$420-million greenfield bleached kraft market pulp mill in Port Westward, Ore., by 1992.

Among integrated papermakers, the kraft paperboard sector is contributing the most to pulp expansion activity, both in plans to overhaul aging facilities to control odor and reduce costs and to provide furnish for new pa-

MAJOR MODERNIZATION/ EXPANSION PROJECTS IN U.S. (over \$100,000,000 at an existing mill site)

	1988-90 +
Blandin Paper , Grand Rapids, Minn.	\$344,000,000 ¹
Boise Cascade , International Falls, Minn.	539,500,000 ¹
Boise Cascade , Rumford, Maine	332,500,000
Bowater , Calhoun, Tenn.	205,000,000
Champion International , Bucksport, Maine	161,000,000 ²
Champion International , Canton, N.C.	200,000,000 ²
Champion International , Courtland, Ala.	408,000,000 ²
Champion International , Quinnesec, Mich.	360,000,000 ¹
Chesapeake , Menasha, Wis.	148,900,000 ¹
Consolidated Papers , Stevens Point, Wis.	111,200,000
Consolidated Papers , Wisconsin Rapids, Wis.	142,700,000
Federal Paper Board , Augusta, Ga.	460,000,000
Fort Howard , Rincon, Ga.	320,000,000 ¹
Gaylord Container , Bogalusa, La.	100,000,000 ¹
Georgia-Pacific , Zachary, La.	285,000,000 ¹
International Paper , Texarkana, Texas	150,000,000 ²
James River , Clatskanie, Ore.	119,800,000 ¹
Kimberly-Clark , Coosa Pines, Ala.	200,000,000 ²
Longview Fibre , Longview, Wash.	209,500,000 ¹
Louisiana-Pacific , Samoa, Calif.	102,000,000
Midtec Paper , Kimberly, Wis.	260,000,000 ¹
Pope & Talbot , Halsey, Ore.	407,053,000 ²
Pottlatch , Cloquet, Minn.	109,000,000 ¹
Scott Paper , Muskegon, Mich.	220,000,000
Scott Paper , Skowhegan, Maine	375,000,000 ¹
Southeast Paper , Dublin, Ga.	300,000,000 ¹
Stone Container , Port Wentworth, Ga.	341,782,000 ²
Temple-Inland , Rome, Ga.	185,000,000
Union Camp , Eastover, S.C.	675,000,000 ^{1,2}
Union Camp , Montgomery, Ala.	188,000,000
Union Camp , Savannah, Ga.	375,000,000 ^{1,2}
Westvaco , Luke, Md.	200,000,000
Westvaco , Wickliffe, Ky.	126,000,000
Weyerhaeuser Paper , Columbus, Miss.	500,000,000

1. Includes new paper machine.

2. Includes programs for completion in 1991 or later.

perboard capacity. Union Camp is the leader in this regard, with two projects under way to modernize pulp facilities in support of linerboard expansions at Montgomery, Ala., and Savannah, Ga. Major programs are also under way at Federal Paper Board's Augusta, Ga., bleached paperboard mill and at Temple-Inland Inc.'s Rome, Ga., linerboard facility.

Mechanical pulp mill spending will get a lift from the newsprint capacity expansion boom. Two mills, Newsprint South Inc. and Ponderay Newsprint Co., are scheduled for startup this year with new thermomechanical pulp facilities, and the new Alabama River Newsprint Co. mill is targeted for 1990. In addition, Blandin Paper Co.'s \$344-million modernization at Grand Rapids, Minn., includes a new pressurized groundwood pulp system.

Machine rebuilds add capacity. Renewed activity in the paper machine rebuild area reflects the big pickup in capacity expansion plans. Mills report plans to spend \$2.09 billion on paper machine modification projects in the 1988-90 period, up 39% from last year. Machine upgrades have had a major role in the industry's modernization efforts since the current economic expansion be-

gan in 1982, but most of the activity has been in cost cutting, product improvement, and grade realignment. New expansion plans based around rebuild projects have reversed this trend.

Rebuilds will contribute the most to new capacity in the paperboard sector, where few new paper machines are currently scheduled. Kraft linerboard has been a focal point for incremental expansion activity recently, especially through installations of high-pressure presses, and this sort of project is spreading now to corrugating medium machines as well. Linerboard mills extensively rebuilding paperboard machines include Georgia-Pacific, Monticello, Miss.; Union Camp, Montgomery, Ala.; Temple-Inland, Rome, Ga., and Orange, Texas; Great Northern Nekoosa Corp., Cedar Springs, Ga.; and Stone Container's, Port Wentworth, Ga.

Among bleached paperboard mills, Federal Paper Board at Augusta, Ga., and International Paper Co. at Pine Bluff, Ark., and Texarkana, Texas, have major modernization and expansion programs under way.

Energy spending flat. Spending for power plant improvements in the U.S. industry has not kept pace with the explosion in overall capital spending plans recently. U.S. mills now report plans to spend \$1.35 billion over the 1988-90 period on energy projects, the same amount reported a year ago for the 1987-89 period. Power plant spending comprises just 10% of currently planned outlays, down from a 17% share at the end of 1987. The drop-off in energy-related projects reflects a shift in emphasis from cost-containment projects in the late 1970s and early 1980s to capacity expansion projects in the late 1980s, as well as lower prices for oil and natural gas.

NEW MILLS AND MACHINES. New paper machines account for 29% of total production spending in this year's survey, up from 25% last year and only 12% the year before. Outlays for new machines total \$3.72 billion, up 85% from a year ago.

The capacity expansion boom has led to an explosion of new paper machine announcements over the past year. Twenty new paper machines at existing mills and eight more at greenfield mills are due for startup during the 1988-91 period. That compares with only 17 new machine projects in last year's survey. The most active grades for new machines are tissue, coated and uncoated free-sheet paper, kraft paperboard, and newsprint.

No greenfield paper mills came online in 1988, but six new paper machines were started up at existing mill locations. Fort Howard Corp. added a second 250-tpd paper machine at its Rincon, Ga., recycled tissue mill, and a third unit is due online this year. Georgia-Pacific started up a new tissue machine in Palatka, Fla., early last year, and James River Corp. installed a new 70,000-tpy unit in Clatskanie, Ore.

Midtec Paper Corp. installed a new coated free-sheet machine in Kimberly, Wis., last year in a \$260-million expansion project. The new unit replaced four older

U.S. GREENFIELD MILL PROJECTS

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

FSC Paper , Alsip, Ill. 80,000-tpy recycled tissue; Sulzer Escher Wyss paper machine	1989
Kimberly-Clark , Jenks, Okla. 68,000-tpy tissue; one paper machine	1989
Newsprint South , Grenada, Miss. 225,000-tpy TMP/newsprint; Beloit paper machine	1989
Ponderay Newsprint , Usk, Wash. 180,000-metric-tpy TMP/newsprint; Valmet paper machine	1989
Alabama River Newsprint , Claiborne, Ala. 220,000-metric-tpy TMP/newsprint; Valmet paper machine	1990
Mead , Phenix City, Ala. 366,000-tpy coated natural kraft paperboard; Valmet paper machine	1990
Mi Ho Paper , St. Joseph, Mo. Recycled coated and uncoated fine paper mill	1990
Willamette Industries , Bennettsville, S.C. 200,000-tpy uncoated free-sheet; Valmet paper machine	1990
WTD Industries , Port Westward, Ore. 300,000-tpy market bleached softwood kraft pulp	1992

PROPOSED (NO STARTUP DATE)

Kenaf International , McAllen, Texas 231,000-metric-tpy kenaf-based newsprint; active project	
Kenaf of North America , Muskogee, Okla. Proposed recycled linerboard mill; arranging financing	
Northeast Paperboard , Northampton, Pa. 500- to 600-tpd recycled linerboard; preliminary study stage	
Trans-Rim , Dunkirk, N.Y. Proposed 200,000-tpy recycled containerboard mill	
Westbrook Wood Products , Medford, Ore. Proposed publication papers mill	

machines. Potlatch Corp. completed a similar, though smaller-scale, project in Cloquet, Minn., where a new coated free-sheet machine replaced three old uncoated units. In a \$285-million program, Georgia-Pacific revamped the kraft pulp mill and installed a new 825-tpd uncoated free-sheet machine at its Zachary, La., mill.

1989 will mark the beginning of a major round of newsprint expansion that many fear will lead to overcapacity problems in the early 1990s. In the U.S., roughly 600,000 tpy of newsprint capacity will come online from three new paper machines. Newsprint South is building a \$320-million facility in Grenada, Miss., Ponderay Newsprint will complete a \$300-million facility in Usk, Wash., and Southeast Paper will bring online a new recycled newsprint machine in Dublin, Ga. Two new tissue mills are also scheduled for completion in 1989: Kimberly-Clark's \$150-million facility in Jenks, Okla., and FSC Paper Co.'s \$62-million mill under construction next to its existing recycled newsprint facility in Alsip, Ill. The other major installation scheduled is Blandin Paper's \$344-million modernization and lightweight coated paper expansion in Grand Rapids, Minn.

Eleven new paper machines are scheduled to come online next year, seven at existing mills and four at greenfield facilities. Mead Corp. is building a new \$556-million coated natural kraft paperboard mill in Phenix City, Ala. Gaylord Container Corp. will complete a new 1,000-tpd linerboard machine at Bogalusa, La., the first new linerboard unit to be built since 1985. Union Camp's \$375-million modernization and expansion in Savannah, Ga., will replace two older units with a new kraft linerboard machine in 1991.

In uncoated free-sheet, Willamette Industries Inc. is building a greenfield mill at Bennettsville, S.C., for start-up in 1990, and Boise Cascade has begun an extensive \$525-million modernization and expansion program in International Falls, Minn. Union Camp will undertake a \$700-million expansion that includes a new paper machine at its Eastover, S.C., mill. Champion International is installing a new coated free-sheet unit at its Quinnesec, Mich., market pulp mill, and Scott Paper Co.'s S.D. Warren Div. is building another lightweight coated free-sheet unit in Skowhegan, Maine. Alabama River Newsprint, a joint venture of Abitibi-Price Inc. and Parsons & Whitemore Inc., will bring online a newsprint mill in Claiborne, Ala., which is expected to cost \$320 million.

Proposed machines close to approval? New mills and machines on the "proposed" list are something of a mixed bag this year. Several new machine projects appear close to approval, especially in the groundwood paper area. With so much capacity already in the pipeline, some of the proposed newsprint projects are likely to stay on hold for awhile, although at least one, Kenaf International, seems to be moving forward. Tissue is in a holding pattern similar to newsprint, with both Fort Howard and James River stretching out the time frame on further expansion projects into the mid-1990s. ■

NEW PAPER MACHINES IN U.S. AT EXISTING MILL SITES

STARTED UP IN 1988

Fort Howard, Rincon, Ga.
250-tpd, 270-in. Beloit twin wire—tissue

Georgia-Pacific, Palatka, Fla.
210-in.-trim No. 5 Beloit—tissue

Georgia-Pacific, Zachary, La.
825-tpd, 345-in.-trim Valmet twin-wire—uncoated free-sheet

James River, Clatskanie, Ore.
70,000-tpy, 276-in. Beloit—tissue

Midtec Paper, Kimberly, Wis.
205,000-tpy, 222-in.-trim Volth, replacing four—coated free-sheet

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

Blandin Paper , Grand Rapids, Minn. 254,000-tpy, 306-in.-trim machine, replacing one—LWC	1989
Fort Howard , Rincon, Ga. 250-tpd, 270-in. Beloit—tissue	1989
Hollingsworth & Vose , Hawkinsville, Ga. Specialty industrial paper machine—auto filter paper	1989
Kimberly-Clark , Whiting, Wis. 30,000-tpy machine—premium correspondence and specialty papers	1989
Southeast Paper Manufacturing , Dublin, Ga. 210,000-tpy, 330-in.-trim Valmet—newsprint	1989
Boise Cascade , International Falls, Minn. 300,000-tpy, 348-in.-trim Valmet—uncoated free-sheet	1990
Champion International , Quinnesec, Mich. 265,000-tpy, 280-in.-trim Beloit—coated free-sheet	1990
Chesapeake , Menasha, Wis. 80,000-tpy Beloit twin-wire—recycled tissue	1990
Consolidated Papers , Stevens Point, Wis. 59,000-tpy, 180-in. Yankee fourdrinier—specialty coated	1990
Gaylord Container , Bogalusa, La. 1,000-tpd machine—kraft linerboard	1990
Longview Fibre , Longview, Wash. 240-in.-trim, 3,000-fpm Beloit—kraft paper	1990
Scott Paper , Skowhegan, Maine Lightweight coated free-sheet machine	1991
Union Camp , Savannah, Ga. 460,000-tpy, 363-in. Valmet, replacing two—kraft linerboard	1991
Union Camp , Eastover, S.C. 240,000-tpy No. 2 machine—uncoated free-sheet	1991

PROPOSED (NO STARTUP DATE)

Bear Island Paper, Ashland, Va.
Proposed 225,000-tpy newsprint machine

Blandin Paper, Grand Rapids, Minn.
Studying a second 220,000 tpy LWC paper machine

Daishowa America, Port Angeles, Wash.
Studying two machines, 220,000 tpy newsprint and 150,000 tpy directory

Federal Paper Board, Augusta, Ga.
Bleached kraft paperboard machine for phase three of expansion

Fort Howard, Rincon, Ga. and Muskogee, Okla.
Tissue machines under consideration for mid-1990s

Fraser Paper, Madawaska, Maine
Studying new lightweight coated paper machine

Great Northern Nekoosa, Ashdown, Ark.
210,000-tpy No. 64 machine—uncoated free-sheet

James River, St. Francisville, La.
Considering new coated printing paper machine

Jefferson Smurfit, Newberg, Ore.
275,000-tpy machine, replacing two—newsprint

Pentair, Duluth, Minn.
Studying second SC-A paper machine

CANADA

NEW MILL PROJECTS ABOUND; ENTREPRENEURS, FOREIGN INVESTORS LEAD EXPANSION DRIVE

■ Canadian capital spending is up 49% in this year's survey after a 48% rise last year. Companies report planned outlays of \$9.92 billion for the 1988-90 period, compared with \$6.67 billion for 1987-89. Capacity expansion is expected to boom, with the growth rate up 200% compared with the ten-year average. Growth will average 4.7%/year through 1990, compared with 1.6%/year from 1978-87, according to the Canadian Pulp & Paper Assn.'s latest survey of expansion plans. As in the U.S., strong demand, high prices, and record profits will fuel higher spending. Newsprint may be weakening, in part because of expectations of a capacity crunch over the next few years, but market pulp remains strong, and prices are high in both grades.

Environmental spending should also keep climbing over the next few years. The dioxin fight will be a costly one, estimated by PAPRICAN at almost \$500 million—\$10 million for each of Canada's 47 mills (these costs are not well represented in P&P's survey since most companies have not yet announced specific spending programs targeting this problem).

Much more than in the U.S., capital spending is getting a boost in Canada from overseas investment, especially from Japan. Most recently, Crestbrook Forest Industries Inc., majority-owned by Honshu Paper Co. and Mitsubishi Corp. of Japan, announced plans to build the largest single-line pulp mill in the world in the Athabasca-

ca-Lac La Biche region of Alberta for startup in late 1991. The 496,000-metric-tpy facility, called Alberta-Pacific Forest Industries Inc., will produce bleached, mostly hardwood kraft market pulp and will be integrated with a paper machine by 1995. Cost of the project is \$1.3 billion (the project was announced too late for inclusion in this article's spending tables).

Of eight other major expansion programs announced during the past twelve months, the four largest involve major investments by overseas papermakers. Daishowa Paper Manufacturing Co. Ltd. of Japan is building a greenfield market bleached kraft mill in Peace River, Alta., for startup in 1990. The \$500-million mill will produce 340,000 tpy. In addition, Oji Paper Co. Ltd. of Japan has entered into a joint venture with Canfor Corp. to boost market pulp capacity 125,000 tpy by 1990 at the Howe Sound Pulp & Paper Co. Ltd. mill in Port Mellon, B.C. That project will cost \$280 million. Howe Sound will then build a new 190,000-tpy newsprint mill in Port Mellon in a \$355-million program targeted for completion in 1991. Fletcher Challenge Canada Ltd., majority-owned by New Zealand's Fletcher Challenge, plans to modernize the Crofton, B.C., mill in a two-phase program costing \$238 million.

Entrepreneurial investment is also a major factor in Canadian spending plans. Led by Repap Enterprises Inc., which plans to spend over \$500 million in the next few years, companies such as Cascades Inc. and St. Marys Paper Inc. that have rescued and rejuvenated old mills are responsible for a share of spending out of proportion to their size. Another group of entrepreneurs has come in from outside the industry and built new capacity, especially in the West. Fibreco Export Inc., British Columbia, and Millar West Pulp, Alberta, exemplify this

CANADA—REPORTED CAPITAL EXPENDITURES FOR 1988-90 + BY REGION AND TYPE OF FACILITY (C\$000)

PRODUCTION-RELATED EXPENDITURES

	WOOD/FIBER		PULPING		NEW MACHINES		REBUILDS		ENERGY		PLANT	
Maritimes	3,424	1%	283,252	7%	464,300	15%	110,000	12%	19,000	4%	6,060	2%
Quebec	56,929	22%	1,211,325	29%	1,280,000	41%	384,637	41%	142,696	28%	154,036	40%
Ontario	19,460	7%	348,955	8%	537,000	17%	177,700	19%	38,000	8%	113,000	29%
Central	7,230	3%	50,875	1%	250,000	8%	0	0%	8,288	2%	5,858	2%
West	176,168	67%	2,284,197	55%	604,216	19%	257,550	28%	297,845	59%	110,919	28%
Total	263,211	100%	4,179,504	100%	3,135,516	100%	929,887	100%	505,829	100%	389,873	100%

ENVIRONMENTAL QUALITY SPENDING

	WATER		AIR		SOLID WASTE		PRODUCTION		ENVIRONMENT ¹		TOTAL	
Maritimes	2,000	1%	0	0%	0	0%	886,036	9%	2,000	0%	888,036	9%
Quebec	57,220	22%	42,404	18%	6,906	25%	3,229,623	34%	118,530	22%	3,348,153	34%
Ontario	33,653	13%	1,383	1%	4,560	17%	1,234,115	13%	41,282	8%	1,275,397	13%
Central	4,680	2%	4,680	2%	390	1%	322,251	3%	9,750	2%	332,001	3%
West	158,269	62%	191,609	80%	15,625	57%	3,730,895	40%	372,418	68%	4,103,313	41%
Total	255,822		240,076		27,481		9,402,920		543,980		9,346,900	

1. Includes unspecified spending not shown in subtotals.

Provinces are assigned to regions as follows: Maritimes: New Brunswick, Newfoundland, Nova Scotia; Central: Manitoba, Saskatchewan; West: British Columbia, Alberta.

group. Both brought new market bleached chemi-thermomechanical pulp (CTMP) mills online last year and are considering new investments to expand capacity.

Production-related spending of \$9.40 billion is up 46% from last year's survey. Environmental spending plans for 1988-90 total \$523 million, up 118% from last year. As in the U.S., the spending outlook appears strong well into the next decade. Projects for startup in 1988 account for \$1.77 billion of the survey total, rising to \$3.83 billion in 1989 and \$3.19 billion in 1990. Reported costs for projects for startup beyond 1990 are \$1.18 billion (not counting the Alberta-Pacific project).

Spending by category. In percentage terms, energy spending is up the most in this year's survey, rising 88% from last year. The most important categories are pulp projects and new paper machines. Spending for pulp projects has risen 70% this year on top of a 53% increase last year. New paper machines are up 43% this year, after a 107% rise in last year's survey. Spending will be relatively flat for paper machine rebuilds, as most capacity expansion programs are focused on new machines. Spending in this area totals \$930 million for 1988-90, up just 4% from last year's survey.

Air-quality projects registered the highest growth in this year's survey of environmental spending. Outlays are pegged at \$240 million, up 132% from last year. Water-quality programs total \$256 million, up 122%, while spending for solid-waste disposal climbed to \$27 million, an increase of 30%.

Mills now report plans to spend C\$506 million over the 1988-90 period on energy-related projects, an 88% increase over last year. Most of that large increase can be attributed to the explosion in greenfield pulp and paper capacity approved since the beginning of the year. Twelve new mills are under construction or planned for startup in the 1988-91 period, compared with just three at this time last year.

Companies report plans to spend \$4.18 billion on pulp mill projects during the 1988-90 period, an increase of 70% over plans reported last year. Pulp improvements account for 45% of total production-related spending, up from just 24% last year. Factoring in the new Alberta-Pacific project, pulp mill spending climbs another \$1 billion, making the increase 111% over last year.

Capacity expansion plans. Canada's two major export grades, newsprint and bleached kraft market pulp, grew sluggishly at best for most of the 1980s. Now, however, growth in newsprint capacity will soar at the highest rate in several decades, CPPA reports. Bleached kraft market pulp will remain in the doldrums through the end of the decade, but expansion activity is picking up dramatically for the early 1990s.

In the paper and paperboard sector, growth will be fueled by continued strong activity in printing and writing paper as well as by the resurgence in expansion plans for newsprint. Producers report plans to add 1.23

million tpy of newsprint capacity by 1990, raising total capacity 12.4% to 11.15 million tpy. Printing and writing paper capacity will jump 40.3%, as mills add 1.11 million tpy to current capacity of 2.76 million tons.

Three new paper mills and six new paper machines at existing facilities are scheduled for startup this year. Three newsprint machines will come online with almost 600,000 tpy of capacity. Atlantic Packaging Products Ltd. is building a recycled mill with two machines to produce newsprint and tissue. Canadian Pacific Forest Products Ltd. will start up a new \$323-million greenfield mill at Gold River, B.C. And Finlay Forest Industries Ltd. will integrate its market refiner mechanical pulp mill at Mackenzie, B.C., with a \$165-million newsprint machine.

Also in 1989, Domtar Inc. will complete its four-year, billion-dollar modernization program in Windsor, Que., with the installation of a second new uncoated free-sheet machine. Another uncoated free-sheet unit will come online at Canadian Pacific's Dryden, Ont., mill. That project is budgeted at \$175 million. Repap is installing a second coated paper machine for its New-

MAJOR MODERNIZATION/ EXPANSION PROJECTS IN CANADA

(over C\$50,000,000 at an existing mill site)

	1988-90 ⁺
Abitibi-Price , Chandlei, Que.	C\$113,000,000
Bowater , Brooklyn, N.S.	128,000,000
Canadian Pacific Forest , Dryden, Ont.	196,130,000 ¹
Canadian Pacific Forest , La Tuque, Que.	62,000,000
Canadian Pacific Forest , Thunder Bay, Ont.	376,680,000 ¹
Cariboo Pulp & Paper , Quesnel, B.C.	67,000,000
Cascades , Port Cartier, Que.	93,540,000
Consolidated-Bathurst , Bathurst, N.B.	94,300,000 ¹
Consolidated-Bathurst , Grand'Mère, Que.	287,500,000 ¹
Crestbrook Forest , Skookumchuck, B.C.	106,435,000 ²
Domtar , Windsor, Que.	428,000,000 ¹
E.B. Eddy Forest Products , Espanola, Ont.	163,055,000 ²
E.B. Eddy Forest Products , Ottawa-Hull, Que.	97,705,000
Eurocan Pulp & Paper , Kitimat, B.C.	126,000,000
Finlay Forest Industries , Mackenzie, B.C.	198,000,000 ¹
Fletcher Challenge Canada , Crofton, B.C.	275,000,000
Fletcher Challenge Canada , Elk Falls, B.C.	84,600,000
Howe Sound Pulp & Paper , Port Mellon, B.C.	260,000,000
Island Paper Mills , New Westmins., B.C.	82,000,000
James MacLaren Industries , Thurso, Que.	168,500,000
Kruger , Corner Brook, Nfld.	119,500,000
Kruger , Trois Rivières, Que.	400,000,000 ¹
MacMillan Bloedel , Port Alberni, B.C.	145,600,000
MacMillan Bloedel , Powell River, B.C.	91,000,000
Quebec & Ontario Paper , Baillet-Latour, Que.	287,600,000 ²
Quebec & Ontario Paper , Thorold, Ont.	188,400,000 ²
Quesnel River Pulp , Quesnel, B.C.	80,000,000
Reed , Quebec City, Que.	146,000,000
Repap Enterprises , Newcastle, N.B.	454,000,000 ¹
Repap Enterprises , Prince Rupert, B.C.	60,000,000
St. Marys Paper , Sault Ste. Marie, Ont.	145,000,000 ¹
Tembec , Temiscaming, Que.	331,056,000 ¹
Weldwood of Canada , Hinton, Alta.	285,000,000
Weyerhaeuser Canada , Prince Albert, Sask.	262,000,000 ¹

1. Includes new paper machine.

2. Includes programs for completion in 1990 and later.

castle, N.B., facility in a \$370-million improvement program. Another integration project is under way at Tembec Inc.'s Temiscaming, Que., mill, where a new \$265-million bleached paperboard machine will start up in 1989.

A second wave of newsprint capacity will hit in 1990, when Kruger Inc. in Trois Rivières, Que., and Canadian Pacific in Thunder Bay, Ont., will bring new machines online. Alberta Newsprint Co. Ltd., a new \$360-million mill in Whitecourt, Alta., is also scheduled for startup in 1990. Kruger will offset its newsprint expansion by converting some capacity at Trois Rivières and Corner Brook, Nfld., to supercalendered papers. Improvements at both mills will cost \$400 million. Also in 1990, Consolidated-Bathurst will complete a \$280-million groundwood specialties machine installation at Grand'Mère, Que., replacing two old machines.

On the market pulp side, Canadian producers plan to double mechanical market pulp capacity by 1990, adding 597,000 tpy to the current total of 599,000 tons. Kraft market pulp capacity is expected to climb just 1.0% by

1990, or 67,000 tpy. Three market mechanical pulp mills are expected to be completed in 1990 and 1991. Nortek Forest Products has signed an agreement to build a new \$60-million proprietary-process hardwood pulp mill in Meadow Lake, Sask., by late 1990. Donohue Inc. plans to build a \$288-million CTMP facility in Matane, Que., for startup in 1990. Louisiana-Pacific Corp. will construct a new 155,000-tpy CTMP facility at Chetwynd, B.C., for completion in 1991. The \$250-million program also includes two waferboard plants.

In the bleached kraft pulp sector, large-scale expansions are under way at Howe Sound Pulp & Paper, Port Mellon, B.C., and Weldwood, Hinton, Alta. Daishowa will build a 340,000-tpy mill in Peace River, Alta., for startup in 1991 at a cost of \$500 million. Repap is considering a pulp expansion of about 90,000 tpy at an undecided location. ■

NEW PAPER MACHINES IN CANADA AT EXISTING MILL SITES

STARTED UP IN 1988

- Consolidated-Bathurst**, Bathurst, N.B.
150,000-tpy, 261-in.-trim Holder Pamac, replacing two—corrugating medium
- St. Marys Paper**, Sault Ste. Marie, Ont.
130,000-short-tpy, 184-in.-trim Tampella—SC groundwood
- Weyerhaeuser Canada**, Prince Albert, Sask.
220,000-tpy, 318-in.-trim Valmet—uncoated free-sheet

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

- Canadian Pacific Forest**, Dryden, Ont. 1989
175,000-tpy, 285-in.-trim Valmet—uncoated free-sheet
- Dorstar**, Windsor, Que. 1989
175,000-tpy, 330-in. Beloit—uncoated free-sheet
- Finlay Forest Industries**, Mackenzie, B.C. 1989
600-tpd, 303-in.-trim Voith—newsprint
- Irving Pulp & Paper**, St. John, N.B. 1989
60,000-tpy, 206-in.-trim Valmet—issue
- Repap Enterprises**, Newcastle, N.B. 1989
260,000-tpy, 300-in.-trim Voith—coated paper
- Tembec**, Temiscaming, Que. 1989
110,000-tpy, 177-in.-trim Tampella—bleached paperboard
- Canadian Pacific Forest**, Thunder Bay, Ont. 1990
240,000-tpy, replacing two—newsprint
- Consolidated-Bathurst**, Grand'Mère, Que. 1990
183,000-tpy machine, replacing two—groundwood specialties
- Kruger**, Trois Rivières, Que. 1990
180,000-metric-tpy, 300-in.-trim Beloit twin wire—newsprint

PROPOSED (NO STARTUP DATE)

- Cascades**, Port Cartier, Que.
210,000-tpy SC paper machine under consideration
- Stora Forest Industries**, Port Hawkesbury, N.S.
225,000-tpy newsprint machine; project put on hold

CANADIAN GREENFIELD MILL PROJECTS (metric tons)

STARTED UP IN 1988

- Fibreco Export**, Taylor, B.C.
180,000-tpy, two-line market bleached CTMP
- Millar Western Pulp**, Whitecourt, Alta.
210,000-tpy, two-line market bleached CTMP

UNDER CONSTRUCTION OR ANNOUNCED WITH STARTUP DATE

- Atlantic Packaging Products**, Whitby, Ont. 1989
Recycled 35,000-tpy tissue and 150,000-tpy newsprint; two Voith machines
- Canadian Pacific Forest**, Gold River, B.C. 1989
225,000-tpy CTMP/newsprint; Beloit paper machine
- Vicell Canada Tissue**, Delta, B.C. 1989
9,000-tpy dry form tissue
- Alberta Newsprint**, Whitecourt, Alta. 1990
220,000-tpy CTMP/newsprint
- Daishowa Paper**, Peace River, Alta. 1990
340,000-tpy bleached kraft market pulp
- Donohue**, Matane, Que. 1990
190,000-tpy bleached market CTMP
- Nortek Forest Products**, Meadow Lake, Sask. 1990
100,000-tpy Stake-process hardwood market pulp
- Alberta-Pacific Forest**, Athabasca-Lac La Biche, Alta. 1991
496,000 tpy bleached kraft paper, mostly hardwood
- Howe Sound Pulp & Paper**, Port Mellon, B.C. 1991
535-tpd TMP/newsprint
- Louisiana-Pacific**, Chetwynd, B.C. 1991
155,000-tpy bleached market CTMP

PROPOSED (NO STARTUP DATE)

- Alcan Aluminum**, Vanderhoof, B.C.
Proposed newsprint or LWC paper mill
- Fibreco Export**, Taylor, B.C.
Studying a second 500-tpd bleached CTMP mill
- Makin Pulp & Paper**, Britannia Beach, B.C.
140,000-tpy CTMP/publication papers; awarded timber rights
- Millar Western Pulp**, Undecided location
Studying sites for second bleached market CTMP mill
- Normick Perron/Forex**, Val d'Or, Que.
225,000-tpy newsprint mill proposed
- Repap Enterprises**, Prince Rupert, B.C.
Considering new coated groundwood paper mill